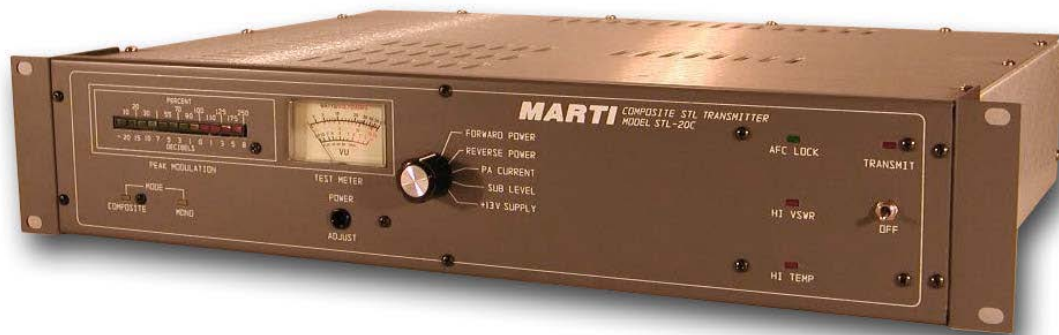




Broadcast Electronics

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Marti Electronics

STL-20C

STL-20M

STL Transmitter

566-036-1 Rev H
July 23, 2015

Marti Electronics

STL-20C

STL-20M

STL Transmitter

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BE reserves the right to repair equipment under warranty with new or refurbished equipment or parts. BE's sole responsibility with respect to any equipment or parts not conforming to this warranty is to replace or repair such equipment upon the return thereof F.O.B. to BE's factory in Quincy, Illinois, U.S.A. In the event of replacement pursuant to the foregoing warranty, only the unexpired portion of the warranty from the time of the original purchase will remain in effect for any such replacement.

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BE is unable to process or resolve component defects or performance concerns on components that have been soldered, installed, wired or in any way altered from new their new condition.
- (d) "Resale Equipment", defined as equipment purchased from another manufacturer or supplier, then resold by BE, shall only carry such manufacturer's or supplier's standard warranty in effect as of the original shipment date.. All warranty claims against any and all 'resale equipment' sold by BE must be filed directly with the original equipment manufacturer. BE is unable to process or resolve equipment defects or performance concerns on products or services not manufactured by BE.

This warranty shall not extend to claims resulting from any acts of God, terrorism, war, defects or failures caused by Purchaser or user abuse or misuse, operator error, or unauthorized attempts to repair or alter the equipment in any way.

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equipment. **The warranty shall be voided if the product or subassembly is equipped with a tamper seal and that tamper seal is broken.** BE shall not be liable for any expense of any nature whatsoever incurred by the original user without prior written consent of BE. The warranty provided herein shall terminate at the end of the period set forth above. **This warranty extends only to the original Purchaser and is not transferable.** There are no third party beneficiaries of any of the provisions of this warranty. If the equipment is described as “used” equipment, it is sold as is and where is and no warranty applies unless authorized in writing.

EXCEPT AS SET FORTH HEREIN, AS TO TITLE AND AS SPECIFICALLY REQUIRED BY LAW, THERE ARE NO OTHER WARRANTIES, OR ANY AFFIRMATIONS OF FACT OR PROMISES BY BE, WITH REFERENCE TO THE EQUIPMENT, OR TO MERCHANTABILITY, FITNESS FOR A PARTICULAR APPLICATION, SIGNAL COVERAGE, INFRINGEMENT, OR OTHERWISE, WHICH EXTEND BEYOND THE DESCRIPTION OF THE EQUIPMENT ON THE FACE HEREOF.



IMPORTANT INFORMATION

EQUIPMENT LOST OR DAMAGED IN TRANSIT -

When delivering the equipment to you, the truck driver or carrier's agent will present a receipt for your signature. Do not sign it until you have:

1) Inspected the containers for visible signs of damage and 2) Counted the containers and compared with the amount shown on the shipping papers. If a shortage or evidence of damage is noted, insist that notation to that effect be made on the shipping papers before you sign them.

Further, after receiving the equipment, unpack it and inspect thoroughly for concealed damage. If concealed damage is discovered, immediately notify the carrier, confirming the notification in writing, and secure an inspection report. This item should be unpacked and inspected for damage WITHIN 15 DAYS after receipt. Claims for loss or damage will not be honored without proper notification of inspection by the carrier.

RF PRODUCT TECHNICAL ASSISTANCE, REPAIR SERVICE, PARTS -

Technical assistance is available from Broadcast Electronics by letter, prepaid telephone or E-mail. Equipment requiring repair or overhaul should be sent by common carrier, prepaid, insured, and well protected. If proper shipping materials are not available, contact the RF Technical Services Department for a shipping container. Do not mail the equipment. We can assume no liability for inbound damage, and necessary repairs become the obligation of the shipper. Prior arrangement is necessary. Contact the RF Technical Services Department for a Return Authorization.

Emergency and warranty replacement parts may be ordered from the following address. Be sure to include the equipment model number, serial number, part description, and part number. Non-emergency replacement parts may be ordered directly from the Broadcast Electronics stock room at the number shown below.

RF TECHNICAL SERVICES -

Telephone: +1 (217) 224-9617

E-Mail: rfservice@bdcast.com

Fax: +1 (217) 224-6258

FACILITY CONTACTS -

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Quincy, Illinois 62305

Telephone: +1 (217) 224-9600

Fax: +1 (217) 224-6258

General E-Mail: bdcast@bdcast.com

Web Site: www.bdcast.com

PARTS -

Telephone: +1 (217) 224-9617

E-Mail: parts@bdcast.com



RETURN, REPAIR, AND EXCHANGES -

Do not return any merchandise without our written approval and Return Authorization. We will provide special shipping instructions and a code number that will assure proper handling and prompt issuance of credit. Please furnish complete details as to circumstances and reasons when requesting return of merchandise. All returned merchandise must be sent freight prepaid and properly insured by the customer.

MODIFICATIONS -

Broadcast Electronics, reserves the right to modify the design and specifications of the equipment in this manual without notice. Any modifications shall not adversely affect performance of the equipment so modified.

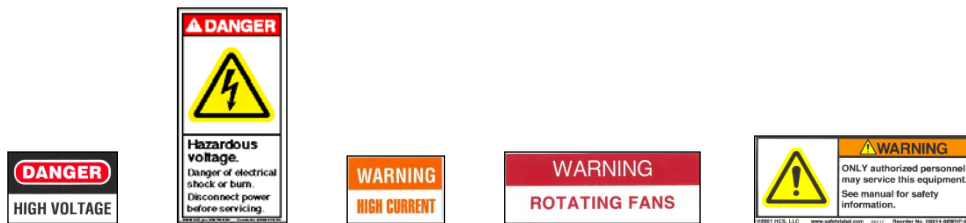




SAFETY PRECAUTIONS

PLEASE READ AND OBSERVE ALL SAFETY PRECAUTIONS!!

ALL PERSONS WHO WORK WITH OR ARE EXPOSED TO POWER TUBES, POWER TRANSISTORS, OR EQUIPMENT WHICH UTILIZES SUCH DEVICES MUST TAKE PRECAUTIONS TO PROTECT THEMSELVES AGAINST POSSIBLE SERIOUS BODILY INJURY. EXERCISE EXTREME CARE AROUND SUCH PRODUCTS. UNINFORMED OR CARELESS OPERATION OF THESE DEVICES CAN RESULT IN POOR PERFORMANCE, DAMAGE TO THE DEVICE OR PROPERTY, SERIOUS BODILY INJURY, AND POSSIBLY DEATH.



DANGEROUS HAZARDS EXIST IN THE OPERATION OF POWER TUBES AND POWER TRANSISTORS -

The operation of power tubes and power transistors involves one or more of the following hazards, any one of which, in the absence of safe operating practices and precautions, could result in serious harm to personnel.

- A. HIGH VOLTAGE** - Normal operating voltages can be deadly. Additional information follows.
- B. RF RADIATION** - Exposure to RF radiation may cause serious bodily injury possibly resulting in Blindness or death. Cardiac pacemakers may be affected. Additional information follows.
- C. HOT SURFACES** - Surfaces of air-cooled radiators and other parts of tubes can reach temperatures of several hundred degrees centigrade and cause serious burns if touched. Additional information follows.
- D. RF BURNS** - Circuit boards with RF power transistors contain high RF potentials. Do not operate an RF power module with the cover removed.

HIGH VOLTAGE –

Many power circuits operate at voltages high enough to kill through electrocution. Personnel should always break the primary AC Power when accessing the inside of the transmitter.

RADIO FREQUENCY RADIATION -

Exposure of personnel to RF radiation should be minimized, personnel should not be permitted in the vicinity of open energized RF generating circuits, or RF transmission systems (waveguides, cables, connectors, etc.), or energized antennas. It is generally accepted that exposure to “high levels” of radiation can result in severe bodily injury including blindness. Cardiac pacemakers may be affected.

The effect of prolonged exposure to “low level” RF radiation continues to be a subject of investigation and controversy. It is generally agreed that prolonged exposure of personnel to RF radiation should be limited to an absolute minimum. It is also generally agreed that exposure should be reduced in working areas where personnel heat load is above normal. A 10 mW/cm² per one tenth hour average level has been adopted by several U.S. Government agencies including the Occupational Safety and Health Administration (OSHA) as the standard protection guide for employee work environments. An even stricter standard is recommended by the American National Standards Institute which recommends a 1.0 mW/cm² per one tenth hour average level exposure between 30 Hz and 300 MHz as the standard employee protection guide (ANSI C95.1-1982).

RF energy must be contained properly by shielding and transmission lines. All input and output RF connections, such as cables, flanges and gaskets must be RF leak proof. Never operate a power tube without a properly matched RF energy absorbing load attached. Never look into or expose any part of the body to an antenna or open RF generating tube or circuit or RF transmission system while energized. Monitor the tube and RF system for RF radiation leakage at regular intervals and after servicing.

HOT SURFACES –

The power components in the transmitter are cooled by forced-air and natural convection. When handling any components of the transmitter after it has been in operation, caution must always be taken to ensure that the component is cool enough to handle without injury.



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1 INTRODUCTION

The Marti STL-20C/M Transmitters with companion R-15C/R-10 Receivers, form a high quality FM, synthesized, point-to-point, line of sight, radio communications link. The STL-20C is frequency agile up to 50 MHz in most models. In standard applications, it allows transmission of composite or mono audio. The STL-20M is a single-channel STL and allows transmission of mono audio only. Complex systems can be built from basic STL-20C/M transmitters and R-15C/R-10 receivers having multiple relay (repeaters), bi-directional (full duplex), and automatic switching standby features. Each STL-20C and STL-20M STL transmitter is offered in a wide range of band models. Refer to the SPECIFICATIONS & ORDERING section for a listing of available frequency ranges and power models.

The STL-20C/M transmitters are each equipped with a wide-band power amplifier producing a radiated RF output power that is adjustable (from the front panel) up to 30 watts in most bands. Unlike older STL models, the power amplifier combined with the wide-band synthesizer benefit the user in that no RF tuning is required. The internal gain stages are pre-matched for optimum performance and stability across the entire band.

The STL-20C/M transmitters operate from 88-132 VAC or 176-264 VAC (manually switched internally), 50/60 Hz. The transmitters can also operate on 12-15 VDC or 15-30 VDC battery or external supply. A meter and selector switch are provided for monitoring forward and reverse power, PA current, sub-level, and power supply voltage. Other front panel indicators include a peak-hold bar graph modulation meter, TRANSMIT, AFC LOCK, HI VSWR, and HI TEMP LED's.

1.1 FEATURES

STL-20C/M Features:

- Up to 30 Watts output power – adjustable from front panel
- No internal RF tuning required
- Very wide-band – up to 50 MHz in most models
- Peak-hold bar graph modulation meter
- Switching Power Supply operates on any AC voltage from 88-132 VAC or 176-264 VAC (manually switched internally), 50/60 Hz
- LED's indicate High VSWR, Over-Temperature, AFC Lock, and Transmit
- External 12-15 VDC or 15-30 VDC supply capability and external transmit control
- Two subcarrier inputs
- High speed μ -controller to perform the following additional features:
 - Power held constant over frequency, temperature, and voltage
 - Hi PA temp and VSWR warning indicators
 - Auto frequency re-lock due to power outage
 - Auto shutdown due to very high PA temp – auto recover after cool down
 - Auto shutdown due to open/short-output – auto recover

The STL-20C Offers the Following Additional Features:

- Frequency agile up to 50 MHz – Dial in frequency direct using internal control board
- Can select composite or mono audio (STL-20M is mono only)
- Digital stereo audio (requires external modems)
- Multi-channel audio or data (requires external MUX)
- Digital data (requires external modems)

1.2 SPECIFICATIONS

Conditions (unless specified otherwise): 1:1 VSWR, 110 VAC input with B+ = 14.5 Volts, 25°C ambient

Frequency Bands and Maximum Output Power:	See ORDERING INFORMATION below.
Type of technology to produce carrier:	Phase-locked loop; synthesized
Type of Modulation:	Direct FM (synthesized)
Frequency Agility and Accuracy STL-20C (450 band models and less)	An executed "dialed-in" frequency that operates within model frequency range will have an accuracy within: (1) $\pm .00004\%$ for frequency divisible by 5 or 6.25 KHz, or
Frequency Agility and Accuracy STL-20C (800 band models and greater)	An executed "dialed-in" frequency that operates within model frequency range will have an accuracy within: (1) $\pm .00004\%$ for frequency divisible by 10 or 12.5 KHz, or (2) $\pm .00015\%$ for MOST frequencies NOT divisible by 10 or 12.5 KHz*
Frequency Selection and Accuracy STL-20M (450 band models and less)	A single frequency, determined at time of order, must operate within model frequency range and will have an accuracy within: (1) $\pm .00004\%$ for frequency divisible by 5 or 6.25 KHz, or
Frequency Selection and Accuracy STL-20M (800 band models and greater)	A single frequency, determined at time of order, must operate within model frequency range and will have an accuracy within: (1) $\pm .00004\%$ for frequency divisible by 10 or 12.5 KHz, or (2) $\pm .00015\%$ for MOST frequencies NOT divisible by 10 or 12.5 KHz*
Operating Temp. Range:	-20°C to +50°C
Frequency Stability (over operating temperature range):	0.0001%
Deviation:	Standard: ± 50 KHz Adjustable up to ± 200 KHz max
Audio Bandwidth:	Mono: 15 KHz Composite: 53 KHz
Signal-to-Noise:	≥ 74 dB, 75 μ sec pre-emphasis, ± 50 KHz deviation
Frequency Response:	Mono: $\pm .05$ dB, 50 Hz – 15 KHz Composite: $\pm .05$ dB, 50 Hz – 53 KHz, $\pm .1$ dB, 53 KHz – 100 KHz, $\pm .2$ dB, 100 KHz – 190 KHz
Distortion:	$\leq 0.2\%$ from 50 Hz – 190 KHz
Separation (Composite only):	50 dB min, 100 Hz – 1 KHz, 55 dB min, 1 KHz – 15 KHz
Spurious Emissions:	More than 60dB below carrier
RF Output Impedance:	50 ohms
Subcarrier Inputs: (select up to 2 with max frequency limited by transmission bandwidth):	Mono: 39 KHz, 67 KHz, 92 KHz, 110 KHz, 152 KHz, 185 KHz Composite: 92 KHz, 110 KHz, 152 KHz, 185 KHz



* - There does exist a few non-standard frequencies that will not automatically tune to within .00015% of requested frequency. For those frequencies, the operator must change to the nearest standard frequency and then manually tune the reference oscillator to desired frequency. Consult factory for frequencies not perfectly divisible by 5 KHz or 6.25 KHz. We will be able to tell you how close the output will come to desired frequency.

1.3 ORDERING

(Must specify 110 or 220 VAC input at time of order)

Conditions (unless specified otherwise): 1:1 VSWR, 110 VAC input with B+ = 14.5 Volts, 25°C ambient

MARTI PART #	Frequency Range (MHz)	Maximum RF Output Power (W)	Typical Max RF Output Power over Frequency	Certifications
STL20C-150-001	135-182	30	20W 135-140 MHz 30W 140-180 MHz 20W 180-182 MHz	
STL20M-150-001	135-182	30	20W 135-140 MHz 30W 140-180 MHz 20W 180-182 MHz	
STL20C-230-001	215-250	30	30W 215-250 MHz	
STL20M-230-001	215-250	30	30W 215-250 MHz	
STL20C-250-001	235-265	30	25W 235-245 MHz 30W 245-265 MHz	
STL20M-250-001	235-265	30	25W 235-245 MHz 30W 245-265 MHz	
STL20C-330-001	300-350	30	20W 300-315 MHz 30W 315-350 MHz	
STL20M-330-001	300-350	30	20W 300-315 MHz 30W 315-350 MHz	
STL20C-450-001	430-480	30	30W 430-480 MHz	
STL20M-450-001	430-480	30	30W 430-480 MHz	
STL20C-950-001	935-965	20	20W 935-960 MHz 18W 960-965 MHz	FCC ID: DDE-STL-20W-950S (FCC Part 74 Subpart E) 940-952 MHz Emission Designators: 20K0F3E, 40K0F3E, 80K0F3E, 194KF8E, 280KF8E, 490KF8E
STL20M-950-001	935-965	20	20W 935-960 MHz 18W 960-965 MHz	FCC ID: DDE-STL-20W-950S (FCC Part 74 Subpart E) 940-952 MHz Emission Designators: 20K0F3E, 40K0F3E, 80K0F3E, 194KF8E, 280KF8E, 490KF8E

Available OPTIONS for the STL-20C/M Transmitters

Marti No.	Description
585-141	12-15 VDC External Supply Cable
585-142	15-30 VDC External Supply Cable
585-017	RF Flexible Cable Assembly, PG1.7B

1.4 UNPACKING AND 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 local 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.



2 INSTALLATION

IMPORTANT NOTICE

This equipment must be operated in a well-ventilated rack cabinet.

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 has 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.

2.1 TRANSMITTER CONNECTIONS - Composite Stereo Operation (STL-20C only)

(Refer to Figure 2-1- Composite & Dual Channel Stereo STL System Block Diagram)

1. The composite signal output from a stereo generator is connected to the BNC jack labeled J2 COMPOSITE IN. 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 PEAK MODULATION bar graph meter on the 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-20C 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
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 Terminal Bus Board or the J4 Accessory D-sub Connector has several uses such as remote control, automatic switching, and external DC power. The Accessory Terminal Bus Board contains all the power and signal interface connections via the 16-pin terminal bus. The appropriate connections are labeled on the board. To access the J4 Accessory D-sub Connector, the Accessory Terminal Bus Board must be removed. See FIGURE 2-2 - J4 Accessory Wiring Diagram, for illustration on how to hook-up.
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 (or 230-volt AC if requested at time of order) 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 or 230 volt, AC outlet receptacle! Failure to use a properly grounded outlet could result in a safety hazard or faulty equipment performance!

2.2 TRANSMITTER CONNECTIONS – Monophonic Operation (STL-20C or STL-20M)

(Refer to Figure 2-1- Composite & Dual Channel Stereo STL System Block Diagram)

1. Monophonic program audio input (balanced) is connected to terminals 1 and 2 on the Accessory Terminal Bus Board (located on the back panel of the STL-20C/M). The audio input can also be connected directly to the J4 ACCESSORY D-sub connector pins 4 and 5 by removing the Accessory Terminal Bus Board. See FIGURE 2-2 - J4 Accessory Wiring Diagram for illustration of how to hook-up audio inputs to the J4 ACCESSORY D-sub connector. 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 Terminal Bus Board or the J4 Accessory D-sub Connector has several uses such as remote control, automatic switching, and external DC power. The Accessory Terminal Bus Board contains all the power and signal interface connections via the 16-pin terminal bus. The appropriate connections are labeled on the board. To access the J4 Accessory D-sub Connector, the Accessory Terminal Bus Board must be removed. See Figure 2-2 - J4 Accessory Wiring Diagram, for illustration on how to hook-up.
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 Marti Part No. 585-017 jumper between the ANTENNA connector of the HRC-10 and the semi-rigid coax. Refer to Figure 2-1 - Composite & Dual Channel Stereo STL System Block Diagram.

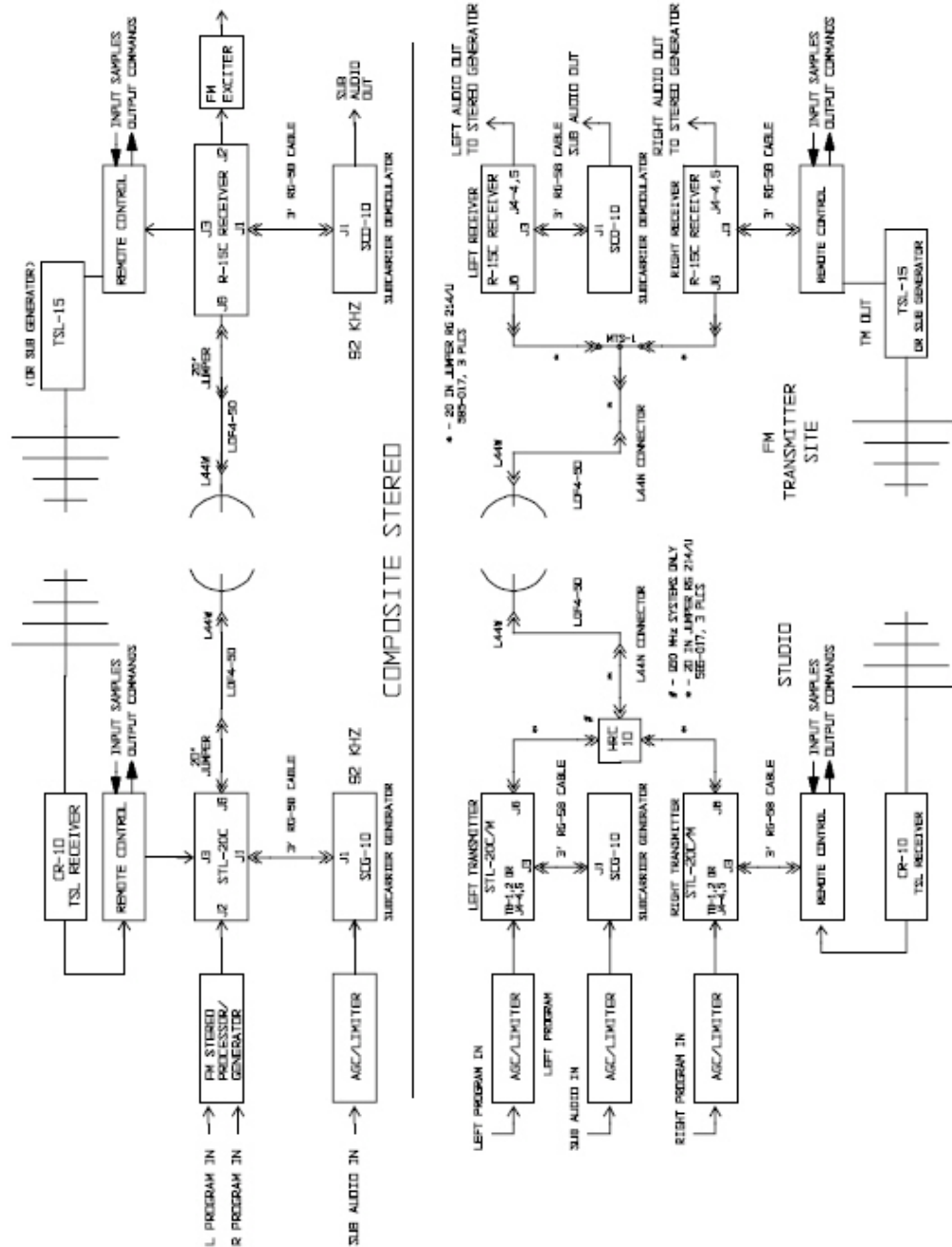


6. Turn transmitter off. Connect AC line receptacle on back of the transmitter to a 115-volt AC power source with special cord set supplied. USE ONLY 3-PRONG GROUNDED OUTLET RECEPTACLES FOR SAFETY.

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!





**FIGURE 1 - Composite & Dual Channel Stereo
STL System Block Diagram**

DUAL CHANNEL STEREO

FOR DETAILED INSTRUCTIONS READ EQUIPMENT INSTRUCTION MANUALS
FOR MUND OPERATION OMIT LEFT TRANSMITTER, RECEIVER, HRC-1D AND MTS-1

1-800-030-1

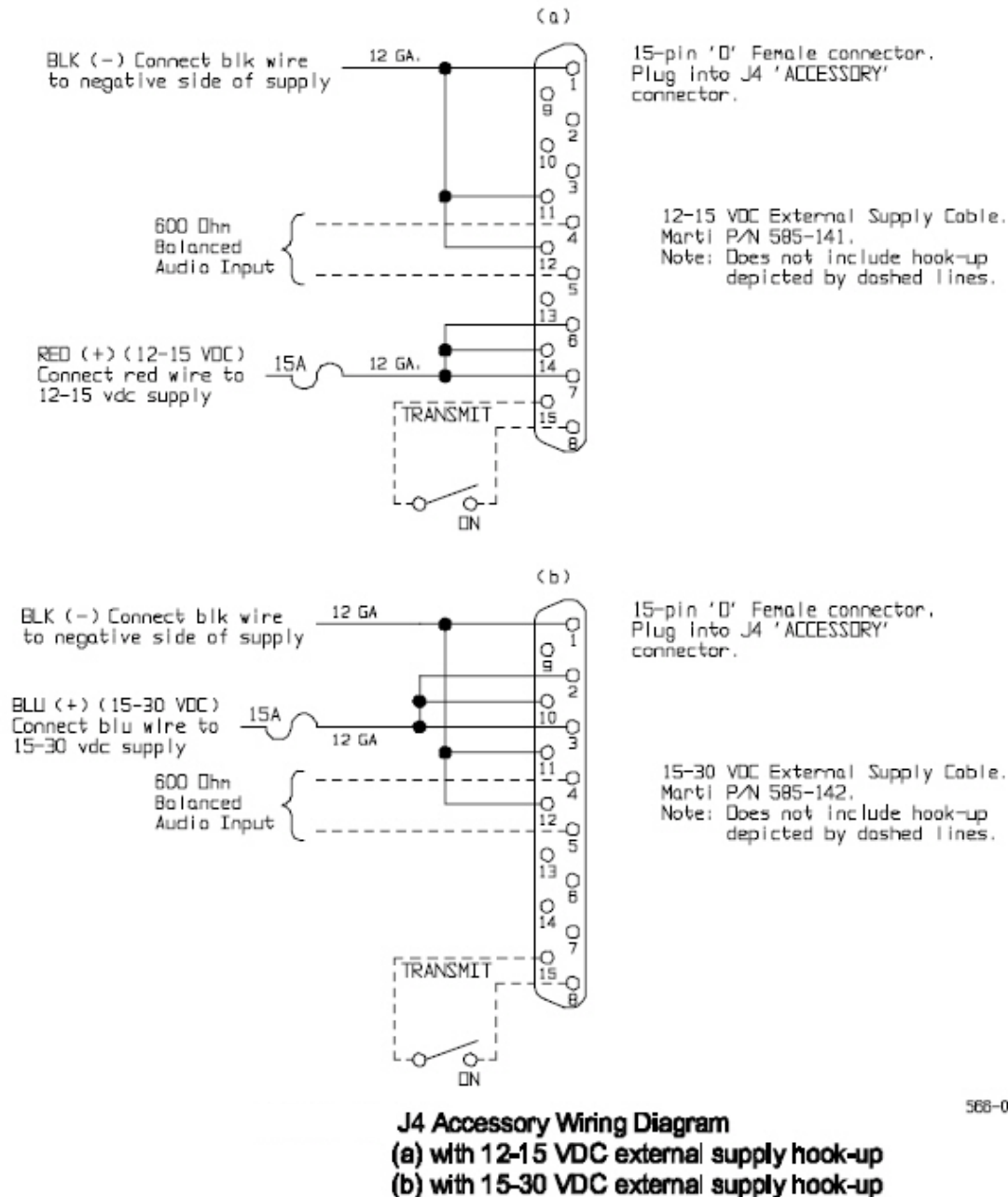


Figure 2-2. J4 Accessory Wiring Diagram

3 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.

3.1.1 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 plan 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!

3.1.2 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.

3.1.3 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.

3.1.4 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.

3.1.5 System Grounding

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

3.1.6 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 a 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.



4 OPERATION

4.1 Quick Start

Connect up the STL-20C/M to the proper antenna. Next, plug in the STL-20C/M to an AC receptacle (there is no power switch). The front panel meter light will immediately come on. Within 5 seconds the AFC LOCK LED will begin flashing indicating that the synthesizer is in the process of locking on a frequency. Also, if the TRANSMIT switch is on, the red TRANSMIT LED will flash in unison with the AFC LOCK LED. During power up, the synthesizer will always lock on the frequency it was locked on to when the STL-20C/M was last powered up.

Within seconds the synthesizer locks on frequency and the AFC LOCK LED will immediately stop flashing and stay on solid green. If the TRANSMIT switch is on, about 3 seconds later the TRANSMIT LED will stop flashing and stay on solid red, and then the STL-20C/M will begin transmitting RF power at whatever setting the POWER ADJUST pot is at. If the TRANSMIT switch is off the TRANSMIT LED will be off. When the operator turns the TRANSMIT switch on, the TRANSMIT LED will come on solid red and the STL-20C/M will begin transmitting.

If the operator is not sure what frequency the STL-20C/M will transmit on, see the Frequency Measurement sub-section in the CALIBRATION AND ADJUSTMENTS section.

To change the frequency, refer to the Changing Output Frequency Direct or Changing (Recalling) Output Frequency via Channel Select sub-sections in this section.

4.2 ANTENNA Connection

Connection of various antenna systems is covered under INSTALLATION and ANTENNAS sections. It is only necessary for the operator or announcer to see that the ANTENNA connector is tight and that the antenna is clear of objects which may affect its radiation efficiency.

CAUTION & WARNING

THE ANTENNA CONNECTOR IS A TYPE "N" FEMALE CONNECTOR AND
REQUIRES A MATING TYPE "N" MALE CONNECTOR.

PLUGGING IN A "UHF TYPE (PL-259 OR SO-239)" INTO THE ANTENNA CONNECTOR
WILL DAMAGE AND SHORT OUT THE ANTENNA CONNECTOR. THIS COULD BURN UP
THE PA MODULE AND OTHER INTERNAL COMPONENTS.



4.3 Connect up STL-20C/M to the AC Line Receptacle or External DC Supply

CAUTION & WARNING

NEVER CONNECT THE STL-20C/M TO THE AC LINE AND EITHER OF THE EXTERNAL DC SUPPLIES AT THE SAME TIME.

DOING SO MAY DAMAGE THE INTERNAL SUPPLY OR THE EXTERNAL DC SUPPLY.

4.3.1 AC Line Operation

Plug the AC cord into the AC Receptacle of the transmitter. Plug the other end of the AC cord into a 88-132 (or 176-264 for export versions) VAC outlet. Since there is no power switch, the STL-20C/M will immediately be powered up.

WARNING

THIS EQUIPMENT MUST BE OPERATED WITH A 3-PRONG, GROUNDED AC OUTLET RECEPTACLE!

FAILURE TO USE A PROPERLY GROUNDED OUTLET COULD RESULT IN A SAFETY HAZARD OR FAULTY EQUIPMENT PERFORMANCE.

IF AN EXTENSION CORD IS USED, IT MUST BE THE THREE-WIRE GROUNDING TYPE TO INSURE SAFETY.

DO NOT CUT OFF THE GROUND PIN OF A 3-PRONG PLUG!!

4.3.2 External DC Supply (12-15 Volt) Operation

The external supply must be capable of delivering 8.5 Amps if running the STL-20C/M at maximum power. If connecting to the Accessory Terminal Bus Board, connect three positive leads to terminals 11, 12, and 13. Connect three negative leads to terminals 8, 9, and 10. If connecting to the 15-pin D-sub Accessory J4 connector, first remove the Accessory Terminal Bus Board. Referring to FIGURE 2-2 - J4 Accessory Wiring Diagram, connect three positive leads of the supply to pins 6, 7, and 14 of the ACCESSORY connector. Connect three negative leads of the supply to three of the four ground pins (pins 1, 8, 11, and 12) of the ACCESSORY connector. Each of the three positive leads and each of the three negative leads should be an 18 gauge wire or one 12 gauge wire split into three at the end.

4.3.3 External DC Supply (15-30 Volt) Operation

The external supply must be capable of delivering 8.5 Amps if running the STL-20C/M at maximum power. If connecting to the Accessory Terminal Bus Board, connect at least three positive leads to terminals 4, 5, 6, and 7. Connect three negative leads to terminals 8, 9, and 10. If connecting to the 15-pin D-sub Accessory J4 connector, first remove the Accessory Terminal Bus Board. Referring to FIGURE 2-2 - J4 Accessory Wiring Diagram, connect four positive leads of the supply to three of the four 15-30VDC pins (pins 2, 3, 9, and 10). Connect three of the four negative leads of the supply to the four ground pins (pins 1, 8, 11, and 12). Each of the four positive leads and each of the four negative leads should be an 18 gauge wire or one 12 gauge wire split into three at the end.

CAUTION & WARNING

NEVER INSTALL AND CONNECT THE 12-15 VOLT AND THE 15-30 VOLT SUPPLIES AT THE SAME TIME.

ALSO, NEVER CONNECT THE 15-30 VOLT SUPPLY TO THE 12-15 VOLT PINS AND NEVER CONNECT THE 12-15 VOLT SUPPLY TO THE 15-30 VOLT PINS.

DOING SO MAY DAMAGE THE INTERNAL SUPPLY OR EITHER OF THE EXTERNAL DC SUPPLIES.

4.4 Transmit-Off Switch

This toggle switch turns on or off the RF output power 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.

4.5 Test Meter

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

1. When switched to FORWARD POWER, the meter indicates the RF power output of the STL-20C/M transmitter.
The maximum power is 20 Watts (18 Watts nominal).
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 current of the final amplifier and its driver is calibrated to read "0 VU" on the meter corresponding to a maximum rated power output.

4.6 LED Indicators (front panel)

1. AFC LOCK light – A solid green LED light is illuminated when the synthesizer VCO is locked on the desired output frequency. If unlocked, or in the process of being locked the AFC LOCK LED flashes green. 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. TRANSMIT light – A solid red LED light is illuminated when the STL transmitter is transmitting output power. If the TRANSMIT switch is on and the STL transmitter is not transmitting output power due to AFC unlock, frequency change or very high temperature fault, the TRANSMIT LED flashes red. If the TRANSMIT switch is off the TRANSMIT LED will also be off.
3. HIGH VSWR light – When the STL is operating at a detected VSWR of less than 2, the HIGH VSWR LED is off and the transmitter can operate up to its maximum power. If the STL internal controller detects a VSWR measured between 2 and 4, the HIGH VSWR LED flashes red at a slow rate of approximately once a second. The STL-20C/M will still attempt to transmit the same forward power as if there was no reflected power.

When the internal controller detects a VSWR of greater than 4 but less than 6, the output power will limit to a maximum of half the rated power (that was set using the MAX PWR pot (R74) located on the synthesizer – see Maximum Power Adjust in the CALIBRATION AND ADJUSTMENTS section) and the HIGH VSWR LED will flash red at a rate of twice per second. When the detected VSWR falls less than 4, the output will resume to its previous power setting, the HIGH VSWR LED will flash at a rate of once per second if VSWR greater than 2, and will turn off if VSWR is less than 2.

When the internal controller detects a VSWR of greater than 6, or detects a reverse power of greater than one-third the maximum rated output power, the output power will immediately shut off, the TRANSMIT LED will flash red, and the HIGH VSWR LED will flash rapidly. Every three seconds the controller will attempt to turn on the transmit output but will again shut down if the conditions have not changed. If this occurs, even if the operator turns off the TRANSMIT switch, the HIGH VSWR LED will still flash rapidly. The only way to stop the HIGH VSWR LED from flashing, is to repair the output (i.e., loose connection of output, wrong connector type, wrong cable, faulty antenna, short circuit cable, etc...), and then turn the TRANSMIT switch on (if it was off), and after 3 seconds if the controller does not detect a very high VSWR or high reverse power, the transmit output power will come on.

4. HIGH TEMP light – When the STL's PA is operating at a temperature of less than 85 degrees C the HIGH TEMP LED will be off. When the internal controller detects a PA temperature between 85 and 100 degrees C, the HIGH TEMP LED will flash red at a slow rate of approximately once a second. When the internal controller detects a PA temperature of greater than 100 degrees C, the HIGH TEMP LED will flash red at a fast rate of approximately twice a second. When this happens the controller will shut down the output power. The output power will remain shut down and the HIGH TEMP LED will flash red twice a second until the PA temperature falls to less than 85 degrees C, upon which the STL will resume transmitting to it previously set power.
5. MODE-COMPOSITE/MONO (STL-20C only) - Amber colored LED lights indicate the selected mode of operation. Jumper plug JP4 on 800-285A20C Audio Processing Board turns on the MONO light; JP3 turns on the COMPOSITE light.



4.7 Peak Modulation Meter

A “peak hold” twelve-segment bar graph display is included on the STL-20C/M 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-20C/M until the 100% bar is flashing on audio peaks. The 110% through 250% bars indicate over-modulation and require a reduction in input level to obtain a 100% peak indication.

4.8 Pre-Emphasis Selection (Mono Operation only)

Two programmable jumper plugs, JP5 and JP6, on 800-285A20C/M 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 DRAWING 800-285A and DRAWING 800-294A 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 a 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 over modulation 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 over modulation 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.

4.9 Power Adjust Pot

Rotating the POWER ADJUST pot clockwise will increase the output power to its maximum power setting. Rotating it counter-clockwise will decrease the output power down to 1 or 2 watts.

4.10 Changing Output Frequency Direct (STL-20C only)

Remove the top cover. Refer to FIGURE 4 – STL-20C/M Adjustment Locations. To change the frequency of the STL-20C, the S8 dip-switches on the 800-386A SYNTHESIZER CONTROL board need to be set with switches 1 and 2 in the “ON” position and switches 3 and 4 in the “OFF” position. These positions are the normal default position and are set at the factory.

When the S8 switches are set as described in the last paragraph, then all that is required is to enter the desired frequency by setting the FREQUENCY SELECT BCD switches S1 through S7 to the valid frequency and pressing the EXECUTE pushbutton S9. S1 is the most significant digit and S7 the least significant digit. For example: For an STL20C-950 model, setting S1=9, S2=5, S3=1, S4=0, S5=1, S6=2, and S7=5 and pressing and releasing the S9 EXECUTE pushbutton switch, the STL-20C will change to the output frequency 951.0125MHz.

In general, if a valid frequency is entered and the EXECUTE pushbutton S9 is pressed and released, then the RF output power will immediately turn off (if it was on to begin with) and the SYNTHESIZER will go through it’s normal routine in searching and locking onto the requested frequency. While searching, the AFC LOCK LED



will flash. When the frequency is found, the AFC LOCK LED will stop flashing and illuminate solid green. After three seconds the TRANSMIT LED will stop flashing and illuminate solid red (assuming the TRANSMIT/STANDBY switch is in the TRANSMIT position) and the STL-20C will resume transmitting at the new frequency and at the same output power it was before leaving the previous frequency.

- What is A Valid Output Frequency?

A valid output frequency is defined as a frequency that operates within the model bandwidth and is either a standard frequency, or is a non-standard frequency that falls within $\pm .00015\%$ of the requested frequency. A standard output frequency is one that is divisible by 5 or 6.25 KHz for 450 band models and less, and divisible by 10 or 12.5 KHz for greater than 450 band models. All other frequencies are considered non-standard frequencies. The STL-20C will lock on all standard output frequencies within a $\pm .00004\%$ tolerance. The STL-20C will lock on about 95% of all non-standard frequencies. The tolerance of these frequencies fall within $\pm .00015\%$ of the requested frequency. If the synthesizer determines that the non-standard frequency will fall outside $\pm .00015\%$ of the requested frequency, then this is considered an invalid frequency. Also, an invalid frequency is one that does not fall within the model bandwidth.

If an invalid frequency is entered in, or if the same frequency that the STL-20C is currently locked on to is entered in, then the STL-20C will remain at its current frequency and current RF output power, i.e., nothing will happen.

4.11 Changing (Recalling) Output Frequency via Channel Select – (STL-20C only)

The frequency can also be changed by entering a channel number that was previously stored with a frequency. See the Storing Output Frequencies into Channels sub-section for instructions on how to store frequencies. There are ten channels available for storing and recalling frequencies. These ten channels are preset with default or customer requested frequencies at the factory.

To change frequency via channel select, remove the top cover and set the S8 dip-switches on the 800-386A SYNTHESIZER CONTROL board (see FIGURE 4 – STL-20C/M Adjustment Locations) with switches 1 and 2 in the "ON" position and 3 and 4 in the "OFF" position. These are the default positions and are in the same position as when changing the frequency direct.

Now you're ready to enter the channel. This is done by setting digits S1 thru S6 of the FREQUENCY SELECT BCD switches equal to zero. Then set digit S7 to the channel of choice (0 thru 9). After entering the channel, press the S9 EXECUTE pushbutton down and then release. The SYNTHESIZER will change to the frequency that was stored in the channel. Re-install the top cover.

4.12 Storing Output Frequencies into Channels (STL-20C only)

The STL-20C must be locked on a frequency before entering that frequency into one of the ten available channels. It is not necessary, however, that the STL-20C be transmitting, hence the TRANSMIT/STANDBY switch can be in STANDBY.

First, remove the top cover. Change the STL-20C to the output frequency to be stored, either directly or via channel select. Set the S8 dip-switches located on the 800-386A SYNTHESIZER CONTROL board (see FIGURE 4 – STL-20C/M Adjustment Locations) as follows: Switches 1, 3, and 4 set to the "OFF" position and switch 2 set to the "ON" position.

Next, set the FREQUENCY SELECT BCD switches S1 thru S6 on the 800-386A SYNTHESIZER CONTROL board equal to zero. Then set S7 to the channel of choice (0 thru 9) to be stored. After entering the channel, press the EXECUTE pushbutton S9 down and then release. The current frequency-in-lock will be stored in the selected channel and the STL-20C will remain at its current frequency. If you need to store more channels, repeat the steps in the last two paragraphs.

Finally, put the S8 dip-switches back to where they were, i.e., switches 1 and 2 in the "ON" position and switches 3 and 4 in the "OFF" position. Re-install the top cover.

It would be a good idea to test the stored channel(s) by changing the frequency to some other frequency and then recalling the stored channel(s).

4.13 Control Switch Settings (STL-20C only)

Control Switch Settings enable or disable important controls used in the STL-20C only. These control settings include the following:

- Power Adjust Pot
- Hi VSWR Foldback Reverse
- Power Calibration Forward
- Power Calibration Hi
- Temperature Shutdown Direct
- Frequency Change Channel
- Frequency Change

Refer to FIGURE 4 – STL-20C/M Adjustment Locations and TABLE 1 - Control Switch Settings Command for disabling or enabling the desired controls. Remove the top cover. On the 800-386A SYNTHESIZER CONTROL board, set the internal dip-switch S8 switches and the FREQUENCY SELECT BCD switches (S1-S7) as outlined in Figure (5). The entries in BOLD are default settings from the factory

When all FREQUENCY SELECT BCD switches have been set to their required values that correspond to the desired control switch setting, you must send the command by pressing the EXECUTE pushbutton S9 down and then releasing. The internal controller will enable or disable the control. Set the internal dip-switch S8 back to its normal position with switch 1 and 2 "ON" and switch 3 and 4 "OFF". Re-install the top cover.

Following is a description of the control settings:

Power Adjust Pot – The default for this setting is "enabled" which allows the user to change the power from almost 0 Watts to the maximum RF output power setting via the front panel POWER ADJUST pot. Refer to the Maximum Power Adjust sub-section in the CALIBRATION AND ADJUSTMENTS section of this manual for information on how to set the maximum power. If this user "disables" this setting, then the RF output power will maintain where last set and tuning of the POWER ADJUST pot will have no effect.

Hi VSWR Foldback – The default for this setting is "enabled". This means when a VSWR is detected greater than 4, the power will limit to half the maximum power setting. If VSWR foldback is "disabled", then the forward RF power will not try to foldback, even when the controller detects a VSWR of greater than 4. The HIGH VSWR LED will still flash however. For maintaining long life from the power amplifier, it is not recommended to disable VSWR Foldback.

Reverse Power Calibration – The default setting for this setting is "disabled". This setting should only be "enabled" during calibration (see the Reverse Power Calibration sub-section in the CALIBRATION AND ADJUSTMENTS section).

Forward Power Calibration – The default setting for this setting is "disabled". This setting should only be "enabled" during calibration (see the Forward Power Calibration sub-section in the CALIBRATION AND ADJUSTMENTS section).



Hi Temperature Shutdown – The default for this setting is “enabled”. See the LED Indicators (front panel) sub-section in this section for complete description of high temperature shutdown. If “disabled”, then the power amplifier will not shutdown due to high temperature but the HIGH TEMP LED will still flash. Again, for maintaining long life from the power amplifier, it is not recommended to disable High Temperature Shutdown.

Direct Frequency Change – The default for this setting is “enabled” to be able to change the output frequency direct. If “disabled”, the internal controller will ignore attempting to change the output frequency. This setting is useful for locking out anyone from changing frequencies, or to change frequencies only via user programmed channels.

Channel Frequency Change – The default for this setting is “enabled” to be able to change the output frequency by channel select. If “disabled”, the internal controller will ignore attempting to change the output frequency by selecting channels.

TABLE 1 - Control Switch Settings Command

CONTROL SETTING	S1	S2	S3	S4	S5	S6	S7
Power Adjust Pot	1	4	0	0	ENB/DIS	0	0
Hi VSWR Foldback	1	2	0	0	ENB/DIS	0	0
Reverse Power Calibration	1	1	0	0	ENB/ DIS	0	0
Forward Power Calibration	1	0	4	0	ENB/ DIS	0	0
Hi Temperature Shutdown	1	0	2	0	ENB/DIS	0	0
Direct Frequency Change	1	0	0	0	ENB/DIS	2	0
Channel Frequency Change	1	0	0	0	ENB/DIS	1	0

Notes:

Internal Dip-Switch (S8): Switch 1, 3, and 4 are “OFF”; Switch2 is “ON” ENB (Enable) = 1, DIS (Disable) = 0

Bold selection indicates factory default setting



5 SYSTEM PERFORMANCE TESTS

The STL-20C/M transmitter, R-15C/R-10 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 in the OPERATION section in the R-15C/R-10 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).

5.1 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 those published under SPECIFICATIONS & ORDERING in this manual.



5.2 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.

5.3 FREQUENCY RESPONSE (monophonic mode)

If the STL-20C/M 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 at the reference, then sweep the audio band for response. Response should be within the limits listed in SPECIFICATIONS & ORDERING.

5.4 COMPOSITE (STEREO) SEPARATION, NOISE, DISTORTION AND FREQUENCY RESPONSE. (composite mode – STL-20C only)

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-20C 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.

6 THEORY OF OPERATION

Refer to Block Diagram Drawing No. Figure 9-1 – Composite/Mono STL-20C/M Transmitter Block Diagram and appropriate Schematic Diagrams.

6.1 SWITCHING POWER SUPPLY, 800-383A

The Switching Power Supply accepts input from 88-132 or 176-264 VAC and supplies 15 VDC and up to 10 Amperes to power the STL-20C/M. The power supply must be switched to the appropriate 115 or 230 position. This is usually done at the factory.

6.2 STL TRANSMITTER I/O Board, 800-379ASM

This board passes and distributes external power supply input via the back-panel ACCESSORY connector. It also passes and directs the TX REM CNTL, and external audio signals. All signals are LC filtered.

6.3 STL-20C/M ALARM/LED BOARD, 800-390A (or 800-376A)

This board contains a toggle switch to control the RF output ("OFF" - "ON") of the transmitter. The synthesizer for control purposes monitors the state of this switch. This board also includes the TRANSMIT, AFC LOCK, HIGH VSWR, and HIGH TEMP LED's. The synthesizer controls the state of these LED's. Finally, 800-390A boards includes two digital POTs, one for forward power, the other for reverse. The synthesizer writes digital data to these POTs corresponding to the forward and reverse power, respectively. The analog output signal of the POTs are fed to the STL-20C/M meter board for forward and reverse power monitoring. For STL-20C/M transmitters that use the 800-376A board, the forward and reverse analog signal feeding the meter board comes directly from the power amplifier board.

6.4 AUDIO PROCESSING BOARD, 800-285A20C/M

The 800-285A20C/M Audio Processing Board is programmable (by jumper plugs) for composite stereo or monaural signal processing:

6.4.1 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. For 800-285A20C boards, 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.

6.4.2 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.



6.5 14.5 VOLT STEP-UP REGULATOR Board, 800-392A

The 800-392A is a DC/DC converter that powers the synthesizer, audio processing boards. It allows the user to apply an external input voltage (through the 12-15 VDC accessory input pins) as low as 7 VDC and still maintain

14.5 volts to the synthesizer and 10.0 volts to the audio and mixer boards. Therefore, the synthesizer will stay locked during most power surges and excessive voltage drops. The 800-392A also suppresses any external (or internal) voltage noise such as an alternator from a running vehicle. As a result, the STL-20C/M still maintains a high signal- to-noise.

6.6 T/R SYNTHESIZER, 800-375AT

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 audio output from the 800-285A20C/M board is fed into T/R SYNTHESIZER's VCO which FM modulates the signal at the final output frequency. This modulated RF output signal is then sent to the 800-388A board for final amplification.

Included on the T/R SYNTHESIZER board is a high-speed microcontroller. For STL-20C transmitters, the microcontroller decodes and acts on instructions sent from the 800-386A SYNTHESIZER CONTROL board. The controller also monitors and regulates forward power, monitors VSWR and PA temperature, performs auto foldback of power due to high VSWR and then recovers when VSWR lowers, and performs auto shutdown of power due to very high temp. The controller also detects synthesizer lock and unlocks as well as enabling a fastlock feature for far frequency changes.

6.7 SYNTHESIZER CONTROL BOARD, 800-386A (or 800-377A) – Used on STL-20C only

This board, with the use of the rotary switches and the pushbutton switch, send the desired instruction with parameters to the T/R SYNTHESIZER board. For the STL-20C the instructions include the following:

1. Frequency Change
2. Forward Power Calibration
3. Reverse Power Calibration
4. Normal Operation
5. Store and recall up to ten channels.

The procedure on when and how to use these instructions is in the TUNE-UP AND ADJUSTMENTS section.

6.8 SYNTHESIZER ADAPTER BOARD, 800-387A – Used on STL- 20M only

This board is simply an adapter between the 800-375A SYNTHESIZER board and external programming board used at Marti Electronics during programming.

6.9 TWO-STAGE RF POWER AMPLIFIER BOARD, 800-388A (or 800-373A)

The RF output signal (50 mW max) from the T/R SYNTHESIZER is fed into this TWO-STAGE RF POWER AMPLIFIER board. The RF goes through two stages of RF amplification. The first stage (U2) is a 1-Watt (max) pre- driver. It has an input and output transformer (T1 and T2) for achieving optimum 50 ohm matching between the stages. The output of T2 is fed into the final PA module (U3) for amplification.. The signal is then low-passed filtered through and then fed through a directional coupler for monitoring forward and reflected power. An automatic level control (ALC) circuit residing on the T/R SYNTHESIZER board stabilizes and maintains an accurate output

power level by comparing it to a reference power level which is set by the user via the front panel POWER ADJUST pot. The ALC circuit samples the forward power via the coupled forward power on PA board. This board also provides regulated B+ for powering the PA and the rest of the chassis. Finally, there also exist circuitry for regulating the fan and monitoring PA current.

6.10 METER BOARD, 800-290A

This board monitors the following signals for viewing via the VU meter:

- Forward Power
- Reflected Power
- PA Current
- Sub Level
- B+ Supply



7 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	Triplett 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

8 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-20C/R-15C Alignment Tool Kit (Marti Part No. 704-175) containing all the above tools may be obtained from the factory.



STL-20C/M TRANSMITTER

FACTORY TEST REPORT

Customer: _____ Address: _____

Serial No.: _____

- _____ Adjust internal switching power supply to approximately 13.5 Volts
- _____ Program synthesizer
- _____ Frequency measurement, adjust, and changing
- _____ Forward power calibration and metering
- _____ Reverse power calibration and metering
- _____ Current metering calibration
- _____ Verify B+ metering
- _____ Adjust audio gain pot for required input modulation to synthesizer
- _____ Modulation meter calibration
- _____ Mono CMR adjustment
- _____ Mono Signal-to-Noise within specifications
- _____ Mono frequency response within specifications
- _____ Mono distortion within specifications
- _____ Composite left-to-right separation within specifications (if applicable)
- _____ Composite frequency response within specifications (if applicable)
- _____ Composite distortion within specifications (if applicable)
- _____ Test 12-15 VDC external supply
- _____ Calibrate internal regulator and test 15-30 VDC external supply

24-Hour Burn-in: Start: Date _____ Time _____
 Stop: Date _____ Time _____

Configure transmitter to Composite _____ or Mono _____ mode
 _____ Fine tune frequency adjust at _____ MHz
 _____ Max power adjust to _____ Watts

Customer Specific Settings (if different from standard):

Deviation _____ Audio response _____ Max power _____

Channel settings (upon request):

CH0:	MHz	CH1:	MHz	CH2:	MHz	CH3:	MHz
CH4:	MHz	CH5:	MHz	CH6:	MHz	CH7:	MHz
CH8:	MHz	CH9:	MHz				

_____ Frequency change disabled (upon request) _____ Channel change disabled (upon request)

DATE: _____ SIGNATURE: _____



9 CALIBRATION AND ADJUSTMENTS

Refer to Location of Adjustments Drawing No. Figure 9-2 – STL-20C/M Adjustment

Locations and appropriate schematic diagrams for each module.

NOTE: For all adjustments the STL-20C/M top cover must be removed and then re-installed upon completion

9.1 Frequency Measurement

The RF output frequency of this transmitter should be measured as often as necessary to insure on-frequency operation and to comply with regulations. Monitor the RF output with a frequency counter via an RF coupler or Watt meter.

WARNING

NEVER CONNECT THE FREQUENCY COUNTER DIRECTLY TO THE RF OUTPUT CONNECTOR OF THE STL-20C/M.

THE FREQUENCY COUNTER SHOULD BE COUPLED OFF OF AN RF COUPLER OR A WATT METER.

EXCEEDING THE INPUT POWER RATING OF THE FREQUENCY COUNTER COULD DO INTERNAL DAMAGE TO IT.

9.2 Frequency Fine-Tune Adjust

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

1. Remove the T/R SYNTHESIZER cover.
2. On the T/R SYNTHESIZER board tweak the FREQ ADJ TCXO (U15) while viewing a frequency counter.
3. Re-install the T/R SYNTHESIZER cover.

9.3 Forward Power Front Panel Meter

This adjustment is also made during the FORWARD POWER CALIBRATION adjustment, but it is not necessary nor is it recommended to perform the FORWARD POWER CALIBRATION adjustment just to calibrate the FRONT PANEL METER FORWARD POWER.

1. With the STL-20C/M powered on and transmitting, tweak the front panel POWER ADJUST pot fully clockwise for maximum power out.
2. Turn the front panel knob to FORWARD POWER.



3. On the 800-290A METER BOARD tweak the FORWARD pot (R8) to correlate the front panel meter to the Bird Watt Meter.

9.4 Reverse Power Front Panel Meter

This adjustment can only be made during the REVERSE POWER CALIBRATION adjustment. If the REFLECTED pot (R9) on the METER BOARD has not been tweaked, then it is probably not necessary to perform this adjustment.

9.5 PA Current Front Panel Meter

1. With the STL-20C/M powered on and transmitting, tweak the front panel POWER ADJUST pot fully clockwise for maximum power out.
2. On the METER BOARD measure the voltage across P1 pin 7 and P1 pin 3, with the positive lead on P1 pin 7.
3. Divide this voltage by 0.025. The result is the PA current.
4. Turn the front panel knob to PA CURRENT.
5. On the METER BOARD adjust the CURRENT pot (R10) to set the front panel meter to equal the calculated current.

9.6 Switching Power Supply Voltage Adjustment

The input to the switching power supply can be from 88-132 or 176-264 VAC, 50/60 Hz. The DC B+ output, measured off of one of the red wires of the switching supply, can be slightly adjusted at B+ ADJUST. The recommended B+ reading should be 13.5 volts.

9.7 B+ Adjustment When Using 15-30VDC External Supply

CAUTION

THIS ADJUSTMENT HAS BEEN SET AT THE FACTORY AND SHOULD NOT REQUIRE ANY FURTHER ADJUSTMENTS.

1. Remove AC line voltage from STL-20C/M.
2. Connect up external supply to the 15-30VDC pins of the Accessory Terminal Bus Board or the 15-pin D-sub J4 connector as described in the INSTALLATION section.
3. Turn on external supply and adjust to approximately 18 VDC.
4. Using a VOLT METER, with negative lead connected to ground (chassis), connect the positive lead to one of the red wires connected to the 800-379ASM I/O board.
5. On the TWO-STAGE RF POWER AMPLIFIER board adjust EXTERNAL B+ ADJUST (pot R5) in the direction required to achieve a B+ reading of 13.0 to 13.5 Volts. This voltage should be adjusted with the TRANSMIT/STANDBY switch in "STANDBY" position.

WARNING

IF THE 15-30 VOLT SUPPLY IS LESS THAN 16 VOLTS, THE EXTERNAL B+ ADJUST SHOULD BE SET TO 12 VOLTS.

THIS MAY LIMIT THE MAXIMUM OUTPUT POWER.



9.8 Maximum Power Adjust

1. Remove the cover from the SYNTHESIZER.
2. With the STL-20C/M powered on and transmitting, tweak the front panel POWER ADJUST pot fully clockwise.
3. On the SYNTHESIZER tweak the MAX PWR pot (R74) clockwise to increase power output, or counter-clockwise to decrease power output. Tweak pot to the desired maximum output power, but do not exceed the Maximum RF Output Power as specified under ORDERING INFORMATION corresponding to your model.
4. Replace the SYNTHESIZER cover.

9.9 Forward Power Calibration (STL-20C only)

(STL-20M models must be calibrated at the factory)

CAUTION

THIS ADJUSTMENT HAS BEEN SET AT THE FACTORY AND SHOULD NOT REQUIRE ANY FURTHER ADJUSTMENTS.

WARNING

TO MAINTAIN CALIBRATION, NEVER ADJUST THE FP CAL (R20) POT ON THE TWO-STAGE RF PA BOARD, OTHERWISE THE FORWARD POWER MUST BE RECALIBRATED.

IF IT BECOMES NECESSARY TO RECALIBRATE, READ AND STUDY THIS SECTION CAREFULLY BEFORE PROCEEDING.

1. Power down the STL-20C (i.e., turn off AC LINE switch or turn off external supply).
2. Make sure that the WATT METER is connected to the ANTENNA connector and that the WATT METER is terminated with a 50-Ohm load rated at 20 Watts minimum.
3. Remove cover from SYNTHESIZER.
4. On the SYNTHESIZER make sure that the P2 jumper is in the FP position (FP is the normal position).
5. On the TWO-STAGE POWER AMPLIFIER board, tweak the FP CAL pot (R20) fully clockwise (approximately 20 turns).
6. On the SYNTHESIZER, tweak the MAX PWR pot (R74) fully counter-clockwise (approximately 20 turns).
7. Power up STL-20C, but leave front panel TRANSMIT/STANDBY switch in the "STANDBY" position. Wait for STL-20C to become locked on frequency.
8. Measure the B+ voltage. Adjust the B+ if necessary by referring to the Switching Power Supply Voltage Adjustment sub-section. If using a 12-15 volt external supply, adjust its voltage to 13.0 to 13.5 volts. It is recommended that the VOLT METER is monitoring B+ throughout this procedure.
9. Referring to TABLE 2 - Forward and Reverse Power Calibration, change the output frequency to the CAL FREQUENCY corresponding to your model.
10. On the 800-386A SYNTHESIZER CONTROL BOARD, adjust S8 dip-switches with switch 1, 3, and 4 "OFF" and switch 2 "ON".
11. Set the BCD switches on the internal SYNTHESIZER CONTROL BOARD as follows:
 - S1 = "1"
 - S2 = "4"
 - S3 = "0"
 - S4 = "0"



- S5 = "0"
 S6 = "0"
 S7 = "0"
12. Depress and release the EXECUTE pushbutton switch S9. This command will disable the front panel POWER ADJUST pot.
 13. Set the BCD switches on the internal SYNTHESIZER CONTROL BOARD as follows:

S1 = "1"
 S2 = "2"
 S3 = "0"
 S4 = "0"
 S5 = "0"
 S6 = "0"
 S7 = "0"
 14. Depress and release the EXECUTE pushbutton switch S9. This command will disable VSWR Foldback.
 15. Set the BCD switches on the internal SYNTHESIZER CONTROL BOARD as follows:

S1 = "1"
 S2 = "0"
 S3 = "4"
 S4 = "0"
 S5 = "1"
 S6 = "0"
 S7 = "0"
 16. Depress and release the EXECUTE pushbutton switch S9. The STL-20C is now in the Forward Power Calibration mode.
 17. On the SYNTHESIZER CONTROL BOARD, adjust S8 dip-switches with switch 1, 2, and 4 "OFF" and switch 3 "ON".
 18. Set the BCD switches on the internal SYNTHESIZER CONTROL BOARD as follows:

S1 = "1"
 S2 = "any number"
 S3 = "any number"
 S4 = "any number"
 S5 = "any number"
 S6 = "any number"
 S7 = "any number"
 19. Depress and release the EXECUTE pushbutton switch S9. This command will set the internal power control pot to maximum and the position of the POWER ADJUST pot is ignored.
 20. Put the TRANSMIT/STANDBY switch in the "TRANSMIT" position. The output power (as indicated by the WATT METER) should be close to 0 Watts.

NOTE

THE HIGH VSWR LED MAY BLINK FROM TIME TO TIME, BUT SIMPLY IGNORE IT DURING THIS CALIBRATION PROCEDURE.

21. The front panel TRANSMIT LED should be off. On the SYNTHESIZER, tweak the MAX PWR pot (R74) clockwise until the TRANSMIT LED just comes on. The output power should increase as indicated by the WATT METER.
22. Referring to TABLE 2 - Forward and Reverse Power Calibration, on the TWO-STAGE POWER AMPLIFIER board, tweak the FP CAL pot (R20) counter-clockwise (slowly) until the output power (as indicated by the WATT METER) reaches the FWD CAL PWR LEVEL corresponding to your model.



WARNING

**THE FP CAL POT (R20) IS NOW
CALIBRATED.**

**DO NOT ADJUST IT
ANYMORE!**

23. On the SYNTHESIZER, tweak the MAX PWR pot (R74) to the desired maximum output power, but do not exceed the Maximum RF Output Power as specified under ORDERING INFORMATION corresponding to your model. Notice that this Maximum RF Output Power is slightly less than the FWD CAL PWR LEVEL.
24. On the SYNTHESIZER CONTROL BOARD, adjust S8 dip-switches with switch 1, 3, and 4 "OFF" and switch 2 "ON".
25. Set the internal BCD switches on the SYNTHESIZER CONTROL BOARD as follows:
 - S1 = "1"
 - S2 = "0"
 - S3 = "4"
 - S4 = "0"
 - S5 = "0"
 - S6 = "0"
 - S7 = "0"
26. Depress and release the EXECUTE pushbutton switch S9. The STL-20C is now out of Forward Power Calibration mode.
27. Set the internal BCD switches on the SYNTHESIZER CONTROL BOARD as follows:
 - S1 = "1"
 - S2 = "2"
 - S3 = "0"
 - S4 = "0"
 - S5 = "1"
 - S6 = "0"
 - S7 = "0"
28. Depress and release the EXECUTE pushbutton switch S9. This command will enable VSWR Foldback.
29. Set the internal BCD switches on the SYNTHESIZER CONTROL BOARD as follows:
 - S1 = "1"
 - S2 = "4"
 - S3 = "0"
 - S4 = "0"
 - S5 = "1"
 - S6 = "0"
 - S7 = "0"
30. Depress and release the EXECUTE pushbutton switch S9. This command will enable the front panel POWER ADJUST pot.
31. Tweak the front panel POWER ADJUST pot fully clockwise to verify that the output power goes to the set maximum power. Tweak the front panel POWER ADJUST pot counter-clockwise verifying that the output power drops as tweaking. The output power should be close to 1 to 2 Watts when the POWER ADJUST pot is fully counter-clockwise.
32. Adjust the POWER ADJUST pot to the desired output power.
33. If you are not satisfied with the maximum output power, first adjust the front panel POWER ADJUST pot fully clockwise for maximum power, then adjust the MAX PWR pot (R74) on the SYNTHESIZER to the desired maximum output power.
34. Replace the cover on the SYNTHESIZER.
35. On the SYNTHESIZER CONTROL BOARD, adjust S8 dip-switches with switch 1 and 2 "ON", and 3 and 4 "OFF". This places the STL-20C back into normal operation.



9.10 Reverse Power Calibration (STL-20C only)

(STL-20M models must be calibrated at the factory)

CAUTION

THIS ADJUSTMENT HAS BEEN SET AT THE FACTORY AND SHOULD NOT REQUIRE ANY FURTHER ADJUSTMENTS.

WARNING

TO MAINTAIN CALIBRATION, NEVER ADJUST THE RP CAL (R17) POT ON THE TWO-STAGE RF PA BOARD, OTHERWISE THE REVERSE POWER MUST BE RECALIBRATED.

IF IT BECOMES NECESSARY TO RECALIBRATE, READ AND STUDY THIS SECTION CAREFULLY BEFORE PROCEEDING.

1. Power down the STL-20C (i.e., turn off AC LINE switch or turn off external supply).
2. Make sure that the WATT METER is connected to the ANTENNA connector.

NOTE

IT IS PRESUMED THAT A BIRD WATT METER OR EQUIVALENT IS USED.

3. Disconnect the 50-Ohm load from the Bird WATT METER.
4. Rotate the element in the Bird Watt Meter 180 degrees counter-clockwise for measuring reverse power.
5. Remove cover from SYNTHESIZER.
6. On the SYNTHESIZER place jumper on P2 in the RP position.
7. On the TWO-STAGE POWER AMPLIFIER board, tweak the RP CAL pot (R17) fully clockwise (approximately 20 turns).
8. On the SYNTHESIZER, tweak the MAX PWR pot (R74) fully counter-clockwise (approximately 20 turns).
9. Power up STL-20C, but leave front panel TRANSMIT/STANDBY switch in the "STANDBY" position. Wait for STL-20C to become locked on frequency.
10. Measure the B+ voltage. Adjust the B+ if necessary by referring to the Switching Power Supply Voltage Adjustment sub-section. If using a 12-15 volt external supply, adjust its voltage to 13.0 to 13.5 volts. It is recommended that the VOLT METER is monitoring B+ throughout this procedure.
11. Referring to TABLE 2 - Forward and Reverse Power Calibration, change the output frequency to the CAL FREQUENCY corresponding to your model.
12. On the SYNTHESIZER CONTROL BOARD, adjust S8 dip-switches with switch 1, 3, and 4 "OFF" and switch 2 "ON".
13. Set the internal BCD switches on the SYNTHESIZER CONTROL BOARD as follows:
 - S1 = "1"
 - S2 = "4"
 - S3 = "0"
 - S4 = "0"
 - S5 = "0"
 - S6 = "0"
 - S7 = "0"



14. Depress and release the EXECUTE pushbutton switch S9. This command will disable the front panel POWER ADJUST pot.
15. Set the internal BCD switches on the SYNTHESIZER CONTROL BOARD as follows:
 - S1 = "1"
 - S2 = "2"
 - S3 = "0"
 - S4 = "0"
 - S5 = "0"
 - S6 = "0"
 - S7 = "0"
16. Depress and release the EXECUTE pushbutton switch S9. This command will disable VSWR Foldback.
17. Set the internal BCD switches on the SYNTHESIZER CONTROL BOARD as follows:
 - S1 = "1"
 - S2 = "1"
 - S3 = "0"
 - S4 = "0"
 - S5 = "1"
 - S6 = "0"
 - S7 = "0"
18. Depress and release the EXECUTE pushbutton switch S9. The STL-20C is now in the Reverse Power Calibration mode.
19. On the SYNTHESIZER CONTROL BOARD, adjust S8 dip-switches with switch 1, 2, and 4 "OFF" and switch 3 "ON".
20. Set the internal BCD switches on the SYNTHESIZER CONTROL BOARD as follows:
 - S1 = "1"
 - S2 = "any number"
 - S3 = "any number"
 - S4 = "any number"
 - S5 = "any number"
 - S6 = "any number"
 - S7 = "any number"
21. Depress and release the EXECUTE pushbutton switch S9. This command will set the internal power control pot to maximum and the position of the POWER ADJUST pot is ignored.
22. Put the TRANSMIT/STANDBY switch in the "TRANSMIT" position. The output "reverse" power (as indicated by the WATT METER) should be close to 0 Watts.

NOTE

THE HIGH VSWR LED MAY BLINK FROM TIME TO TIME, BUT SIMPLY IGNORE IT DURING THIS CALIBRATION PROCEDURE.

23. The front panel TRANSMIT LED should be off. On the SYNTHESIZER, tweak the MAX PWR pot (R74) clockwise until the TRANSMIT LED just comes on. The output "reverse" power should increase as indicated by the WATT METER.
24. Referring to TABLE 2 - Forward and Reverse Power Calibration, on the TWO-STAGE POWER AMPLIFIER board, tweak the RP CAL pot (R17) counter-clockwise (slowly) until the output power (as indicated by the WATT METER) reaches the REV CAL PWR LEVEL corresponding to your model.



WARNING

**THE RP CAL POT (R17) IS NOW
CALIBRATED.**

**DO NOT ADJUST IT
ANYMORE!**

25. On the SYNTHESIZER, tweak the MAX PWR pot (R74) so that the reverse output power reads 10 Watts as indicated by the Bird WATT METER.
26. Turn the front panel METER SELECT knob to REVERSE POWER.
27. On the 800-290A METER BOARD tweak the REFLECTED pot (R9) to correlate the front panel meter to the Bird Watt Meter.
28. On the SYNTHESIZER, tweak the MAX PWR pot (R74) fully counter-clockwise.
29. Put the TRANSMIT/STANDBY switch in the "STANDBY" position.
30. Remove the SYNTHESIZER P2 jumper from the RP position and put the jumper in the FP position.
31. On the SYNTHESIZER CONTROL BOARD, adjust S8 dip-switches with switch 1, 3, and 4 "OFF" and switch 2 "ON".
32. Set the internal BCD switches on the SYNTHESIZER CONTROL BOARD as follows:
 - S1 = "1"
 - S2 = "1"
 - S3 = "0"
 - S4 = "0"
 - S5 = "0"
 - S6 = "0"
 - S7 = "0"
33. Depress and release EXECUTE pushbutton switch S9. The STL-20C is now out of Reverse Power Calibration mode.
36. Set the internal BCD switches on the SYNTHESIZER CONTROL BOARD as follows:
 - S1 = "1"
 - S2 = "2"
 - S3 = "0"
 - S4 = "0"
 - S5 = "1"
 - S6 = "0"
 - S7 = "0"
37. Depress and release the EXECUTE pushbutton switch S9. This command will enable VSWR Foldback.
38. Set the internal BCD switches on the SYNTHESIZER CONTROL BOARD as follows:
 - S1 = "1"
 - S2 = "4"
 - S3 = "0"
 - S4 = "0"
 - S5 = "1"
 - S6 = "0"
 - S7 = "0"
39. Depress and release the EXECUTE pushbutton switch S9. This command will enable the front panel POWER ADJUST pot.
40. Re-connect the 50-Ohm load on the WATT METER.



41. Rotate the WATT METER element clockwise 180 degrees.
42. Put the TRANSMIT/STANDBY switch in the "TRANSMIT" position.
43. Tweak the front panel POWER ADJUST pot fully clockwise.
44. Adjust the MAX PWR pot (R74) on the SYNTHESIZER to the desired maximum output power, but do not exceed the Maximum RF Output Power as specified under ORDERING INFORMATION corresponding to your model.
45. Replace the cover on the SYNTHESIZER.
46. On the SYNTHESIZER CONTROL BOARD, adjust S8 dip-switches with switch 1 and 2 "ON", and 3 and 4 "OFF". This places the STL-20C back into normal operation.



TABLE 2 – Forward and Reverse Power Calibration

MODEL	CAL FREQUENCY (MHz)	FWD CAL PWR LEVEL (W)	REV CAL PWR LEVEL (W)
STL20C-150	175.0000	38.4	19.2
STL20M-150	175.0000	38.4	19.2
STL20C-230	235.0000	32.0	12.8
STL20M-230	235.0000	32.0	12.8
STL20C-250	250.0000	32.0	12.8
STL20M-250	250.0000	32.0	12.8
STL20C-330	330.0000	32.0	12.8
STL20M-330	330.0000	32.0	12.8
STL20C-450	450.0000	32.0	12.8
STL20M-450	450.0000	32.0	12.8
STL20C-950	950.0000	22.4	9.6
STL20M-950	950.0000	22.4	9.6

9.11 Mono and Composite Audio

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

9.11.1 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 R63 on the 800-375 T/R 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.



9.11.2 Adjustments for composite model (STL-20C only)

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-20C. 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-20C bar graph display flashes. This will be 100% modulation of the STL-20C.

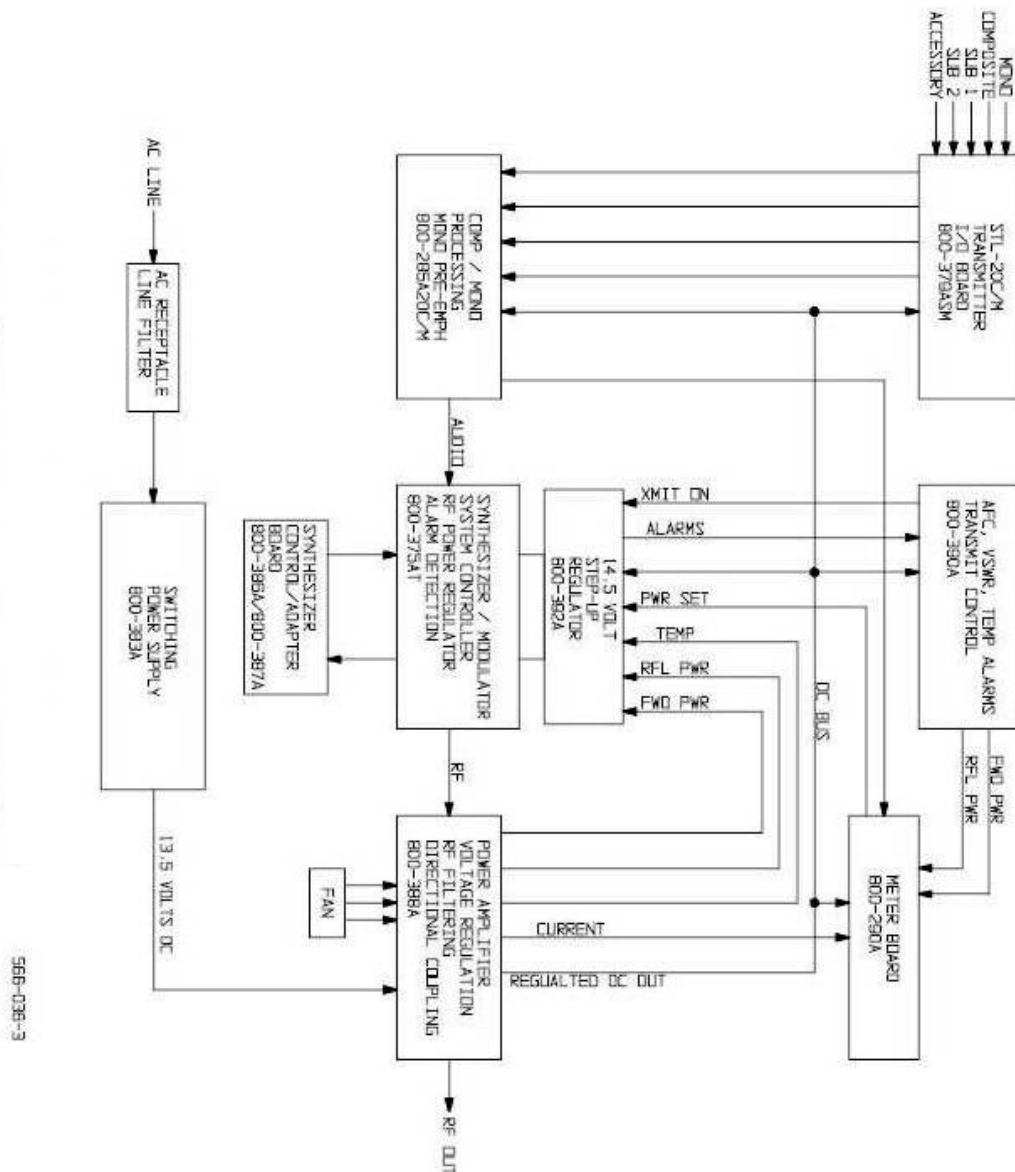


Figure 9-1. Composite/Mono STL 20C block Diagram

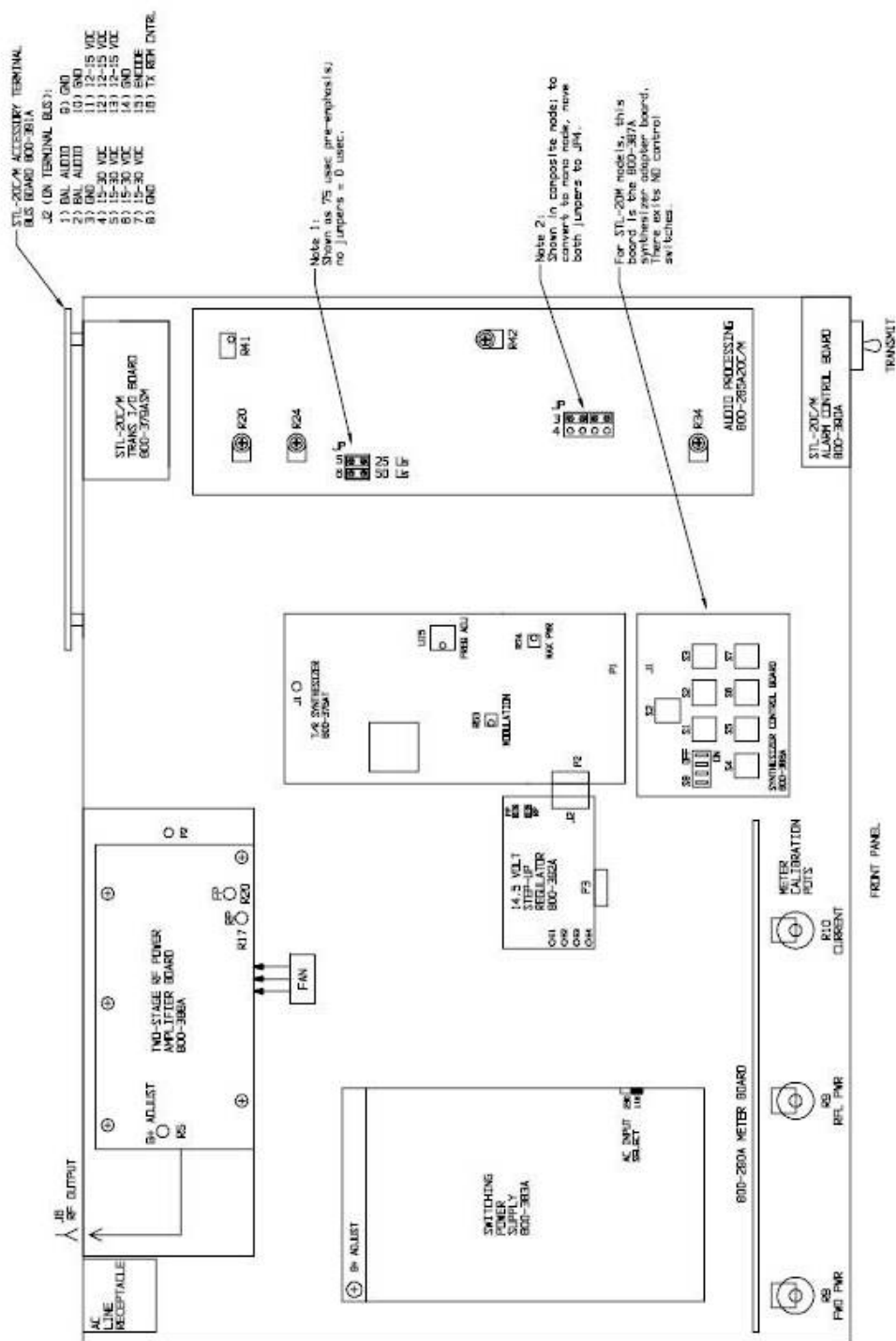


FIGURE 4 - STL-20C/M Adjustment Locations

Figure 9-2. STL 20C/M Adjustment Locations.

10 STL 20C BILL OF MATERIAL

This bill of material uses an indented structure to show relationships of parts into sub assemblies.

Example; all BOM LEVEL 2 parts are contained in the BOM LEVEL 1 part immediately above it.

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
0	706-STL20C-xx0	ASSY, STL20C TX		
..1	339-0006	FILTER,RFI,10A 250VAC,50/60HZ	1	
..1	400-0600	STRIP,QUIET SHIELD,6.00x.197	1	
..1	403-0001	FOOT,RUBBER-COMPACT CASE	4	
..1	410-113	LED,YELLOW RECTANGLE	2	
..1	417-0036	PIN CONN,AMP,350967-1	2	
..1	418-0702	HSNG,PIN 2 PIN 1-640507 AMP	1	
..1	420-0817	ASSY,FEMALE SCREWLOCK 205817-1	1	
..1	420-2105	SCREW,2-56X.312,S.S. PH SC	2	
..1	420-3720	SCREW,M3 X 20,PHILLIPS PAN HEAD,SS	4	
..1	420-4104	SCREW,4-40X.250,S.S. PH	16	
..1	420-4105	SCREW,4-40X.312,S.S. PH	2	
..1	420-4106	SCREW,4-40X.375,S.S. PH	4	
..1	420-6104	SCREW,6-32X.250,S.S. PH	5	
..1	420-6106	SCREW,6-32X.375,S.S. PH	3	
..1	421-4008	4-40 KEP NUT	2	
..1	421-6008	6-32 KEP NUT	4	
..1	422-6107	SCREW,SEMS 6-32 X 7/16 PAN PH.ST."	14	
..1	423-4002	#4 LOCK S.S. SPLIT	4	
..1	469-0009	SHIELD,MARTI PA	1	
..1	471-5376	BRACKET, FAN, STL-20C/STL-20M	1	
..1	471-5377	COVER, STL-20C/STL-20M	1	
..1	471-5380	PANEL, REAR, STL-20C/STL-20M	1	
..1	471-5381	CHASSIS, STL-20C/STL-20M	1	
..1	471-5385	FILLER,REAR,SRPT-30	1	
..1	500-002-1	Hex Nut, #4-40 Regular Nickel Plated	3	
..1	500-033	Screw, 6 x 1/4 phillips head SM SS type A"	18	
..1	500-055	Lockwasher, #4 internal tooth small pattern zinc plated	12	
..1	500-164	Flat Washer, Micro Plastics #FW250-062 nylon	1	
..1	500-180	Screw, 4-40 x 1/4 phillips pan head M/S Black Zinc"	7	
..1	500-181	Screw, #4 x 1/4 phillips pan head S/M Black Zinc"	6	
..1	500-187	Screw, #6 x 1/4 phillips pan head S/M type A black zinc	8	
..1	500-188	Screw, 4-40 x 3/8 phillips,flat head,black oxide"	2	
..1	500-199	Keps nut 4 x 40 zinc 4CNKEOZ	4	
..1	500-210	Screw,SEMS 4-40x1/4 Phil Pan Head MS Blk Zinc(external lock)	12	
..1	500-211	Screw,SEMS 4-40x3/8 Ph Pan Head MS Black Zinc (External)	8	
..1	510-026	Fuse, 2 1/2 Amp. Slo-Blo, 3AG Littlefuse #31302.5	1	
..1	510-072	Fuseholder, Littlefuse #342-004	1	

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	510-113	Bushing, #B-312-250 black shorty Microplastic #22MP01015	1	
..1	510-212	CONTROL KNOBS, #45KNO23	1	
..1	510-231	FAN, AXIAL 12VDC 60X60X25MM	1	
..1	510-247	Bushing, B-500-375 shorty Heyco 2820	1	
..1	513-026	STANDOFF, 1/4HEX x 0.5"LONG, 4-40"	8	
..1	513-035	STANDOFF, 1/4HEX x 0.625"LONG, 4-40"	4	
..1	513-040	STANDOFF, 1/4HEX x 0.5"LONG, 4-40, NYLON"	8	
..1	550-015	Connector, UG-625B/U BNC receptacle Amphenol 31-236 *NOTE*	3	
..1	586-101	Cable Assy, Input Filter Bd STL10/R10/R15C/STL15C (SBCM)	1	
....2	550-126	Connector, crimp terminal pin Molex 08-50-0187	3	
....2	550-183	Connector, 3 pin Molex housing 09-50-8030	1	
....2	580-053	Wire, UL1061 22/7 OTC White/Black	0.4	
....2	580-062	Wire, UL1061 22/7 OTC Yellow/Slate	0.4	
....2	580-064	Wire, UL1061 22/7 OTC Yellow/Orange	0.4	
..1	586-115	CABLE ASSEMBLY W/2 CONN.	1	
..1	586-194	Cable Assembly, AC Connector to Fuseholder (SBCM)	1	
....2	512-020	TERMINAL, NICHIFU TMDN #125-250-03FA TERMINAL	2	
....2	580-130	Wire, Stranded UL1015-20/10 Black Tinned Copper	0.32	
..1	586-195	Cable Assembly, AC Connector to Ground (SBCM)	1	
....2	410-1416	LUG, TERM, BENT, 11/16	1	
....2	512-020	TERMINAL, NICHIFU TMDN #125-250-03FA TERMINAL	1	
....2	580-130	Wire, Stranded UL1015-20/10 Black Tinned Copper	0.32	
..1	586-212	CABLE ASSY, STL-20C/M MAIN HARNESS (SBCM)	1	
....2	410-1410	LUG, TERM, 1/2	2	
....2	417-0053	SKT, CONN 641294-1 AMP	2	
....2	417-0601	HOUSING, SKT, 6PIN, AMP MOD IV	1	
....2	417-0602	HOUSING, 16 PIN, DOUBLE ROW, AMP 1-87456-2	2	
....2	417-8766	CONTACT, CRIMP, MOD-IV 87809-1	32	
....2	418-0701	CONN, HOUSING, 2 PIN	1	
....2	550-122	CONNECTOR, 10 PIN MOLEX HOUSING 09-50-8100	2	
....2	550-135	Connector, 6 pin Molex housing 09-50-8060	1	
....2	550-137	Connector, 8 pin Molex housing 09-50-8080	6	
....2	550-327	Connector, Crimp Terminal Pin Molex 08-52-0112	52	
....2	580-040	Wire, UL1061 22/7 OTC Black	8.25	
....2	580-043	Wire, UL1061 22/7 OTC Red	6.96	
....2	580-088	Shielded Wire, 16-C-22-SPJ White/Red 1 Cond. 22/19x34 pvc	1.5	

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	580-089	Shielded Wire, 16-C-22-SPJ White/Orange 1 cond 22/19x34 pvc	0.6	
....2	580-090	Shielded Wire, 16-C-22-SPJ White/Yellow 1 Cond.22/19x34 pvc	0.6	
....2	580-091	Shielded Wire, 16-C-22-SPJ White/Green 1 Cond.22/19x34 pvc	0.6	
....2	580-092	Shielded Wire, 16-C-22-SPJ White/Blue 1 Cond.22/19x34 pvc	0.6	
....2	580-099	Shielded Wire, 16-C-22-SPJ White/Black 1 Cond. 22/19x34 pvc	0.6	
....2	580-130	Wire, Stranded UL1015-20/10 Black Tinned Copper	1.75	
....2	580-133	Wire, UL1061-18/16 #18 Red #M370-2	4.33	
....2	580-134	Wire, UL1061-18/16 #18 Black	1.42	
....2	580-136	Wire, UL1061-18/16 #18 Blue	2.17	
....2	601-2209	WIRE,AWG22,19/34 WHT	31.43	
....2	602-2202	WIRE,TW,AWG22,PVC INS,BLK/RED	0.288	
..1	594-0073	LABEL,WARNING ROTATING FANS	1	
..1	594-0505	LABEL, WARNING-ONLY AUTHORIZED PERSONNEL	1	
..1	700-226-3	Bracket, STL-10/Rec. Rack	2	
..1	700-226-60	AC Receptacle Cover	1	
..1	700-226-61	Cover,Two Stage Power Amplifier	1	
..1	700-226-62	Front Panel, STL-20C	1	
....2	700-226-62-009	PANEL, FRONT, STL-20C, UNSCREENED	1	
..1	800-285A20C	STL-20C Audio Processing Board	1	
....2	100-1041	RES,1K OHM,1/4W,1%	2	R23, R47
....2	100-1051	RES,10K OHM,1/4W,1%	8	R1, R4, R9, R10, R39, R40, R43, R48
....2	100-1551	RES,15K OHM,1/4W,1%	2	R7, R38
....2	101-502	POT,5K,SINGLE TURN,HORIZONTAL PCB MOUNT	4	R20, R24, R34, R42
....2	103-1062	RES,100K OHM,1/4W,1%,METAL	3	R18, R36, R37
....2	103-2211	RES,22.1K OHM,1/4W,1%,METAL	5	R19, R22, R27, R32, R35
....2	103-2945	RES,29.4K OHM,1/4W,1%,METAL	1	R31
....2	103-3924	RES,3.92K OHM,1/4W,1%,METAL	1	R8
....2	103-4741	RES,4.75K OHM,1/4W,1%,METAL	4	R2, R3, R5, R6
....2	103-4755	RES,47.5K OHM,1/4W,1%,METAL	3	R25, R26, R33
....2	103-5365	RES,53.6K OHM,1/4W,1%,METAL	1	R21
....2	104-502	Potentiometer, 5K ohm cermet Spectrol 64Y502 top adjust	1	R41
....2	145-010	RESISTOR, 1 OHM 1/4 WATT 5% CARBON FILM 29AB250-1	1	R45
....2	145-030	RESISTOR, 3.3 OHM 1/4 WATT 1% METAL FILM MEPCO SFR25	1	R46
....2	145-124	Resistor, 120k ohm 1/4 watt 5% carbon comp 30BJ250	2	R14, R15
....2	145-150-C	Resistor, 15 ohm 1/4 watt 5% carbon comp 30BJ250	1	R13B



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	145-182-1	RESISTOR, 1.8K OHM 1/4 WATT 1% RL07S182G MF	1	R12B
....2	145-183-1	RESISTOR, 18K OHM 1/4 WATT 1% RL07S183G	2	R28, R29
....2	145-241-1	RESISTOR, 240 OHM 1/4 WATT 1% SFR55 240 1% TR	1	R11
....2	145-431	Resistor, 432 ohm 1/4 watt 1% metal film Mepco SFR25	1	R44
....2	145-470	Resistor, 47.5 ohm 1/4 watt 1% metal film Mepco SFR25	1	R49
....2	145-681	RESISTOR, 681 OHM 1/4 WATT 1% METAL FILM MEPCO SFR25	2	R16, R17
....2	145-912-1	RESISTOR, 9.1K OHM 1/4 WATT 1% RL07S912G	1	R30
....2	215-102	CAPACITOR, .001 uFD 2.5% 100V POLYPRO	1	C26
....2	215-151C	Capacitor, 150pF 5% 200V ceramic dipped C322C151J2G5CA	2	C22, C25
....2	215-202	Capacitor, .002 mfd 2.5% 100v polypro Seacor PFWAB200HGEE	1	C27
....2	215-242	CAPACITOR, .0024 UF 2.5% 100V POLYPRO	1	C24
....2	215-301	CAPACITOR, 300 PF 2.5% 100V POLYPRO	1	C21
....2	215-332	Capacitor, 3300 pf 2.5% 100v polypro Seacor PFWAB330HGUE	1	C38
....2	215-502	CAPACITOR .005 uFD 2.5% 100V POLYPRO	1	C42
....2	217-103	CAP,0.1UF 250VDC 5%,POLY FILM	2	C8, C37
....2	219-102	CAPACITOR, ELECTROLYTIC 1000uF 16V	6	C1, C2, C4, C7, C34, C43
....2	219-220	CAPACITOR, ELECTROLYTIC 22uF RADIAL 35V	9	C6, C10, C11, C14, C15, C20, C23, C29, C36
....2	219-221	CAPACITOR, ELECTROLYTIC 220uF 25V RADIAL	2	C28, C32
....2	255-100	CAPACITOR, 10 PF 5% NPO DISC	1	C18
....2	255-220	CAPACITOR, 22 pF 5% NPO DISC	1	C41
....2	255-241	Capacitor, 240 pf 500v 5% silver mica CD10FD241J03	1	C5
....2	255-390C	Capacitor, 39pF 5% 200V ceramic dipped C322C390J2G5CA	3	C31, C35, C40
....2	255-470C	CAP, 47pF 5% 200V CERAMIC DIPPED	2	C3, C30
....2	256-131	CAPACITOR, 130 pF 5% 50V NPO DISC	1	C19
....2	270-102	Cap,monolithic,1000pf 50v 5%KemetC1206C102J5GACTR marked	6	C9, C12, C13, C16, C17, C33
....2	290-522	CAP, VARIABLE, 3-10 PF	1	C39
....2	340-0004	SW,JUMPER PROGRAMMABLE	4	P5, P6, P3-1, P3-2
....2	400-275	IC, OP-AMP DUAL BIPOLAR/JFET, AUDIO	4	IC1, IC2, IC3, IC5
....2	401-338	IC, SMT, REGULATOR, 5 AMP, LM338T *NOTE*	1	IC4
....2	412-494	DIODE, GERMANIUM 1N270 (note)	1	D1
....2	414-007	Diode, General Instruments 1N4007	2	D2, D3
....2	500-162	Screw, 4-40 x 7/16 phillips pan head MS zinc plated"	1	
....2	500-199	Keps nut 4 x 40 zinc 4CNKEOZ	1	

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	520-051	HEATSINK, THERMALLOY 6030B-TT	1	
....2	550-123	Connector, 10 pin header (cut from 550-162)	2	P1, P2
.....3	550-162	Connector, 24 pin break-away (straight) Molex 26-48-6248	0.417	
....2	550-191	Conn,2 dual pin header(cut from 550-316 Molex 10-89-1801)	1	JP-5/JP-6
.....3	550-316	HEADER, BREAKAWAY 40x2, 0.1 SPACING"	0.05	
....2	550-197	Header, Breakaway 4x2,0.1 Spacing(Cut from 550-316)"	1	JP-3/JP-4
.....3	550-316	HEADER, BREAKAWAY 40x2, 0.1 SPACING"	0.1	
....2	800-285B	PC Board, Audio Processing	1	PCB
....2	DB61024	Washer, TO-220 Shoulder NYL Thermalloy #7721-7PPS	1	
....2	DB68027	Sil Pad TO220 .75x.5" ADHSV Berquist 3223-07AC-58"	1	
..1	800-290A	STL-10A/15C/20C/20M Meter Board (SBCM)	1	
....2	030-046M	METER, 60 WATTS, VOLTS/AMPS, VU	1	
....2	101-502	POT,5K,SINGLE TURN,HORIZONTAL PCB MOUNT	1	R5
....2	103-4755	RES,47.5K OHM,1/4W,1%,METAL	1	R6
....2	103-502	POT,5K,SINGLE TURN,VERTICAL PCB MOUNT	3	R8, R9, R10
....2	145-150-C	Resistor, 15 ohm 1/4 watt 5% carbon comp 30BJ250	4	R1, R2, R3, R4
....2	145-431	Resistor, 432 ohm 1/4 watt 1% metal film Mepco SFR25	1	R7
....2	145-562	RESISTOR, 5.6K OHM 1/4 WATT 5% METAL FILM	2	R11, R12
....2	414-007	Diode, General Instruments 1N4007	1	D1
....2	420-4104	SCREW,4-40X.250,S.S. PH	2	
....2	500-055	Lockwasher, #4 internal tooth small pattern zinc plated	4	
....2	500-133	Screw, 4-40 x 5/8 binding head nickel plated"	2	
....2	510-196	SUBMINIATURE LAMP, LUMEX IFL-LX2162-16T	2	B1, B2
....2	513-022	STANDOFF,1/4HEX x 0.375"LONG,4-40"	4	
....2	513-033	Spacer, 4-40 x 13/16 hex threaded Concord 535-8413-02	2	
....2	530-059	SWITCH, ROTARY	1	S1
....2	550-149	Connector, 6 pin Molex angle header (cut from 550-163)	1	P2
.....3	550-163	Connector, 24 pin break-away (angle) Molex 26-48-6246	0.25	
....2	550-176	Connector, 8 pin Molex angle header (cut from 550-163)	1	P1
.....3	550-163	Connector, 24 pin break-away (angle) Molex 26-48-6246	0.333	
....2	550-208	Connector, 3 pin single row header (cut from 550-207)	1	P3
.....3	550-207	Connector, Single row Header Samtec TSW-150-17-T-S-LL	0.177	
....2	580-005	Buss Wire, #22AWG Solid Tinned Copper	0.333	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	800-280A	STL-10/15 LED Array Board	1	P3
.....3	100-1051	RES,10K OHM,1/4W,1%	1	R4
.....3	103-1007	RES,1 MEG OHM,1/4W,1%,METAL	1	R1
.....3	103-2241	RES,2.21K OHM,1/4W,1%,METAL	4	R6, R7, R8, R9
.....3	145-302	Resistor, 3k ohm 1/4 watt 1% metal film 29MF250	1	R2
.....3	145-681	RESISTOR, 681 OHM 1/4 WATT 1% METAL FILM MEPCO SFR25	1	R5
.....3	145-823	Resistor, 82.5k ohm 1/4 watt 1% metal film 29MF250	1	R3
.....3	299-150	Cap.,Tantalum, 1.5 mf 35v ECS-F1VE155K Panasonic P2060-ND	1	C3
.....3	299-220	Capacitor, tantalum, 2.2 mf 25v ECS-F1EE225K Panasonic	1	C1
.....3	299-470	CAP, TANTALUM, 4.7 UF 16V	2	C2, C4
.....3	401-412	INTEGRATED CIRCUIT, SANYO LB1412 (NOTE)	1	IC1
.....3	411-225	LED BAR GRAPH DISPLAY LUMEX SSA-LXH1225-23707	1	D1-D12
.....3	500-120	Eyelet, #1-544047-5 copper	2	
.....3	550-206	Connector, bottom entry Molex 22-14-2034 OR 22-17-2032	1	P1
.....3	800-280B	PC Board, LED Meter STL-10	1	PCB
....2	800-290B	PC Board, Meter STL-15C	1	PCB
..1	800-379ASM	STL-20C/M TRANSMITTER I/O BOARD ASSY	1	
....2	550-186	Connector, 3 pin Molex header (cut from 550-162)	1	P1
.....3	550-162	Connector, 24 pin break-away (straight) Molex 26-48-6248	0.125	
....2	800-379AR	RPU Transmitter I/O Board Assy (SBCM)	1	
.....3	270-102	Cap,monolithic,1000pf 50v 5%KemetC1206C102J5GACTR marked	6	C1, C2, C3, C4, C5, C6
.....3	270-220	Cap, monolithic chip, 22 pf 50v 5% KEMET C1206C220J5GACTR	3	C7, C8, C9
.....3	330-024	Inductor, 10uH SMT DN12103JTR-ND DELEVAN 5%	7	L3, L4, L5, L6, L7, L8, L9
.....3	350-196	Inductor, SMT, Power, 0.68, Coilcraft DO3316P-681HC	2	L1, L2
.....3	500-162	Screw, 4-40 x 7/16 phillips pan head MS zinc plated"	2	
.....3	550-170	Connector, D-Sub 15 pin angle	1	J4
.....3	550-176	Connector, 8 pin Molex angle header (cut from 550-163)	1	P2
.....4	550-163	Connector, 24 pin break-away (angle) Molex 26-48-6246	0.333	
.....3	550-211	Conn,2x8 pin dual row header right angle cut from 550-217	1	P3
.....4	550-217	Dual Right Angle Breakaway Header Amp #571-41033300 40x2	0.2	
.....3	800-379B	PC Board, STL/RPU Transmitter I/O	1	
..1	800-383A	POWER SUPPLY, SWITCHING 15V, 10A	1	

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	800-386A	STL-20C SYNTHESIZER CONTROL BOARD ASSEMBLY (SBCM)	1	
....2	185-102	Resistor, 1K ohm 1/8 watt 1% chip Dale CRCW1206-1K	6	R33, R34, R37, R38, R39, R40
....2	185-2.74K	Resistor, SMT, size 1206, 2.74K ohms, Dale CRCW1206-2.74K	1	R35
....2	185-4.75K	Resistor, SMT, 1206, 4.75K, Dale CRCW1206-4.75K	32	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32
....2	185-5.11K	Resistor, SMT, size 1206, 5.11K ohms, Dale CRCW1206-5.11K	1	R36
....2	298-105	Cap SMT 1mF 16V Tantalum Kemet T491A105M016AS	1	C3
....2	298-476	Capacitor, Tantalum, SMT, size D, 47uF, 16V Kemet T491D476K016AS	2	C1, C2
....2	400-106	IC, Inverter, Open-drain Gate	4	U5, U6, U7, U8
....2	401-165	IC, 8-Bit Ser/Par In, Ser Out SR Phillips 74HC165D	4	U1, U2, U3, U4
....2	417-1606	CONN, HEADER, 16-PIN, PCB MOUNT	1	P2
....2	420-141	Transistor, SMT, Darlington, NPN, Motorola MMBTA14LT1	1	Q1
....2	530-064	SWITCH, MINIATURE TACT, PCB	1	S9
....2	530-091	Switch, Rotary Dip, SMT, BCD-10 Position Grayhill 94HAB10W	7	S1, S2, S3, S4, S5, S6, S7
....2	530-092	Switch, DIP, 4-position, SMT, Apem DM04	1	S8
....2	550-328	Conn, Header 8X2, Dual Row Right Angle, 0.1sp-Molex 0719730208	1	J1
....2	800-386B	STL-20B SYNTHESIZER CONTROL BOARD	1	
..1	800-390A	STL-20C/M ALARM/LED BRD ASSY (SBCM)	1	
....2	185-1.21K	Resistor, SMT, size 1206, 1.21K ohms, Dale CRCW1206-1.21K	1	R1
....2	185-102	Resistor, 1K ohm 1/8 watt 1% chip Dale CRCW1206-1K	2	R11, R14
....2	185-103	Resistor, 10K ohm 1/8 watt 1% chip Dale CRCW1206-10K	2	R12, R13
....2	185-392	Resistor, SMT, size 1206, 392 ohms, Dale CRCW1206-392	1	R2
....2	185-475	Resistor, SMT, Size 1206, 475 ohms, Dale CRCW1206-475	8	R3, R4, R5, R6, R7, R8, R9, R10
....2	298-105	Cap SMT 1mF 16V Tantalum Kemet T491A105M016AS	4	C1, C2, C3, C4
....2	400-295	IC, OP-AMP, GENERAL PURPOSE, OP295GS	1	UB
....2	401-164	IC, SMT, 8-Bit Ser In, Par Out SR Phillips 74HC164D	1	U2
....2	401-317	IC, SMT, Regulator, Adjustable, 1.5 Amps, National LM317AEMP	1	U1
....2	401-374	IC, OCTAL D FLIP-FLOP W 3-ST OUT	1	U3



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	408-402	ICSMT, Digital Pot,2 Ch,100K ohms,Analog Device AD8402AR100	1	U12
....2	410-155	LED, Red rectangular #604-L113HDT	3	D1, D2, D3
....2	410-255	LED, Green rectangular Lumex#SSL-LX2573GD	1	D4
....2	420-141	Transistor, SMT, Darlington, NPN, Mototrola MMBTA14LT1	1	Q5
....2	439-041	TRANSISTOR, SMT, GENERAL PURPOSE, NPN	4	Q1, Q2, Q3, Q4
....2	510-005	Polytube, Manhattan#AF155A-20-yel	0.166	
....2	530-008	Switch, toggle SPDT Apem #5636AB16	1	S1
....2	550-176	Connector, 8 pin Molex angle header (cut from 550-163)	1	P1
.....3	550-163	Connector, 24 pin break-away (angle) Molex 26-48-6246	0.333	
....2	800-390B	STL-20C/M ALARM/LED BRD	1	
..1	800-391A	STL-20 ACCESSORY TERMINAL BUS BOARD (SBCM)	1	
....2	412-1600	BARR STP,16 POS,BEAU	1	TB2
....2	417-1513	RCPT,15 PIN D, FEMALE	1	
....2	800-391B	STL-20 ACCESSORY TERMINAL BUS PCB	1	
..1	800-392A	14.5 VOLT STEP-UP REGULATOR (SBCM)	1	
....2	070-2265-L25	CAP,TANT,22 MFD,20%,25V, E CASE,LOW ESR,SMD	2	C1, C5
....2	185-103	Resistor, 10K ohm 1/8 watt 1% chip Dale CRCW1206-10K	1	R2
....2	185-110K	RESISTOR, SMT, 1206, 110K OHM, 1%	1	R1
....2	185-162K	RES,162K OHM,1%,0.25W,1206	1	R4
....2	185-2.74K	Resistor, SMT, size 1206, 2.74K ohms, Dale CRCW1206-2.74K	1	R7
....2	185-392	Resistor, SMT, size 1206, 392 ohms, Dale CRCW1206-392	1	R6
....2	185-393	Resistor, SMT, 1206, 39.2K ohm 1% Dale CWCR1206-39.2K	1	R5
....2	185-6.81K	Resistor, SMT, 1206, 6.81K Ohm, Dale CRCW1206-6.81K	1	R3
....2	270-101	Cap., monolithic chip, 100 pf 50v 5% Kemet C1206C101J5GAC	1	C4
....2	270-102	Cap,monolithic,1000pf 50v 5%KemetC1206C102J5GACTR marked	2	C6, C7
....2	270-682	CAPACITOR, SMT, 1206, 6800 PF, 5%	1	C2
....2	298-105	Cap SMT 1mF 16V Tantalum Kemet T491A105M016AS	1	C8
....2	298-106	Cap., Tantalum, SMT, Size B, 10uF, 16V,Kemet T491B106K016AS	1	C3
....2	340-0004	SW,JUMPER PROGRAMMABLE	1	
....2	350-103P	INDUCTOR, SMT, POWER, 10UH	1	L1
....2	350-201	INDUCTOR, SMT, 1812, 82NH	1	L2
....2	400-196	IC, SMT, 1.5A STEP-UP REGULATOR	1	U1
....2	401-317	IC, SMT, Regulator,Adjustable, 1.5 Amps,National LM317AEMP	1	U2
....2	413-1597	TERM,TURRET,2 SHLDR,.219,GOLD FLASH	4	E1, E2, E3, E4

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	417-2043	RCPT, 20 POS, 2 ROW, R-ANG, PCB	1	J2
....2	418-120	DIODE, SMT, 1A, SCHOTTKY RECTIFIER	1	D1
....2	550-191	Conn,2 dual pin header(cut from 550-316 Molex 10-89-1801)	1	P1
.....3	550-316	HEADER, BREAKAWAY 40x2, 0.1 SPACING"	0.05	
....2	550-269	Connector,Header 10 Pin RI-10-1 Unsheltered 5x2x1 (note)	1	P4
....2	550-325-16	Conn,16-Pin (cut from 550-325) Right Angle	1	P3
.....3	550-325	CONN, RIGHT ANGLE DUAL ROW 80-PIN	0.2	
....2	800-392B	PCB, 14.5 VOLT STEP-UP REGULATOR	1	



11 STL 20M BILL OF MATERIAL

This bill of material uses an indented structure to show relationships of parts into sub assemblies. Example; all BOM LEVEL 2 parts are contained in the BOM LEVEL 1 part immediately above it.

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
0	706-STL20M-xx0	ASSY, STL20M TX		
..1	339-0006	FILTER,RFI,10A 250VAC,50/60HZ	1	
..1	400-0600	STRIP,QUIET SHIELD,6.00x.197	1	
..1	403-0001	FOOT,RUBBER-COMPACT CASE	4	
..1	417-0036	PIN CONN,AMP,350967-1	2	
..1	418-0702	HSNG,PIN 2 PIN 1-640507 AMP	1	
..1	420-0817	ASSY,FEMALE SCREWLOCK 205817-1	1	
..1	420-2105	SCREW,2-56X.312,S.S. PH SC	2	
..1	420-3720	SCREW,M3 X 20,PHILLIPS PAN HEAD,SS	4	
..1	420-4104	SCREW,4-40X.250,S.S. PH	16	
..1	420-4105	SCREW,4-40X.312,S.S. PH	2	
..1	420-4106	SCREW,4-40X.375,S.S. PH	4	
..1	420-6104	SCREW,6-32X.250,S.S. PH	5	
..1	421-4008	4-40 KEP NUT	2	
..1	421-6008	6-32 KEP NUT	4	
..1	422-6106	SCREW,SEMS 6-32 X 3/8 PAN PH. ST."	3	
..1	422-6107	SCREW,SEMS 6-32 X 7/16 PAN PH.ST."	14	
..1	423-4002	#4 LOCK S.S. SPLIT	4	
..1	469-0009	SHIELD,MARTI PA	1	
..1	471-5376	BRACKET, FAN, STL-20C/STL-20M	1	
..1	471-5377	COVER, STL-20C/STL-20M	1	
..1	471-5380	PANEL, REAR, STL-20C/STL-20M	1	
..1	471-5381	CHASSIS, STL-20C/STL-20M	1	
..1	471-5382	PANEL, FRONT, STL-20M	1	
..1	471-5385	FILLER,REAR,SRPT-30	1	
..1	500-002-1	Hex Nut, #4-40 Regular Nickel Plated	3	
..1	500-033	Screw, 6 x 1/4 phillips head SM SS type A"	18	
..1	500-055	Lockwasher, #4 internal tooth small pattern zinc plated	12	
..1	500-164	Flat Washer, Micro Plastics #FW250-062 nylon	1	
..1	500-180	Screw, 4-40 x 1/4 phillips pan head M/S Black Zinc"	7	
..1	500-181	Screw, #4 x 1/4 phillips pan head S/M Black Zinc"	6	
..1	500-187	Screw, #6 x 1/4 phillips pan head S/M type A black zinc	8	
..1	500-188	Screw, 4-40 x 3/8 phillips,flat head,black oxide"	2	
..1	500-199	Keps nut 4 x 40 zinc 4CNKEOZ	4	
..1	500-210	Screw,SEMS 4-40x1/4 Phil Pan Head MS Blk Zinc(external lock)	12	
..1	500-211	Screw,SEMS 4-40x3/8 Ph Pan Head MS Black Zinc (External)	8	
..1	510-026	Fuse, 2 1/2 Amp. Slo-Blo, 3AG Littlefuse #31302.5	1	

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	510-072	Fuseholder, Littlefuse #342-004	1	
..1	510-113	Bushing, #B-312-250 black shorty Microplastic #22MP01015	1	
..1	510-212	CONTROL KNOBS, #45KNO23	1	
..1	510-231	FAN, AXIAL 12VDC 60X60X25MM	1	
..1	510-247	Bushing, B-500-375 shorty Heyco 2820	1	
..1	513-026	STANDOFF, 1/4HEX x 0.5"LONG, 4-40"	8	
..1	513-035	STANDOFF, 1/4HEX x 0.625"LONG, 4-40"	4	
..1	513-040	STANDOFF, 1/4HEX x 0.5"LONG, 4-40, NYLON"	8	
..1	550-015	Connector, UG-625B/U BNC receptacle Amphenol 31-236 *NOTE*	3	
..1	586-101	Cable Assy, Input Filter Bd STL10/R10/R15C/STL15C (SBCM)	1	
....2	550-126	Connector, crimp terminal pin Molex 08-50-0187	3	
....2	550-183	Connector, 3 pin Molex housing 09-50-8030	1	
....2	580-053	Wire, UL1061 22/7 OTC White/Black	0.4	
....2	580-062	Wire, UL1061 22/7 OTC Yellow/Slate	0.4	
....2	580-064	Wire, UL1061 22/7 OTC Yellow/Orange	0.4	
..1	586-115	CABLE ASSEMBLY W/2 CONN.	1	
..1	586-194	Cable Assembly, AC Connector to Fuseholder (SBCM)	1	
....2	512-020	TERMINAL, NICHIFU TMDN #125-250-03FA TERMINAL	2	
....2	580-130	Wire, Stranded UL1015-20/10 Black Tinned Copper	0.32	
..1	586-195	Cable Assembly, AC Connector to Ground (SBCM)	1	
....2	410-1416	LUG, TERM, BENT, 11/16	1	
....2	512-020	TERMINAL, NICHIFU TMDN #125-250-03FA TERMINAL	1	
....2	580-130	Wire, Stranded UL1015-20/10 Black Tinned Copper	0.32	
..1	586-212	CABLE ASSY, STL-20C/M MAIN HARNESS (SBCM)	1	
....2	410-1410	LUG, TERM, 1/2	2	
....2	417-0053	SKT, CONN 641294-1 AMP	2	
....2	417-0601	HOUSING, SKT, 6PIN, AMP MOD IV	1	
....2	417-0602	HOUSING, 16 PIN, DOUBLE ROW, AMP 1-87456-2	2	
....2	417-8766	CONTACT, CRIMP, MOD-IV 87809-1	32	
....2	418-0701	CONN, HOUSING, 2 PIN	1	
....2	550-122	CONNECTOR, 10 PIN MOLEX HOUSING 09-50-8100	2	
....2	550-135	Connector, 6 pin Molex housing 09-50-8060	1	
....2	550-137	Connector, 8 pin Molex housing 09-50-8080	6	
....2	550-327	Connector, Crimp Terminal Pin Molex 08-52-0112	52	
....2	580-040	Wire, UL1061 22/7 OTC Black	8.25	
....2	580-043	Wire, UL1061 22/7 OTC Red	6.96	
....2	580-088	Shielded Wire, 16-C-22-SPJ White/Red 1 Cond. 22/19x34 pvc	1.5	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	580-089	Shielded Wire, 16-C-22-SPJ White/Orange 1 cond 22/19x34 pvc	0.6	
....2	580-090	Shielded Wire, 16-C-22-SPJ White/Yellow 1 Cond.22/19x34 pvc	0.6	
....2	580-091	Shielded Wire, 16-C-22-SPJ White/Green 1 Cond.22/19x34 pvc	0.6	
....2	580-092	Shielded Wire, 16-C-22-SPJ White/Blue 1 Cond.22/19x34 pvc	0.6	
....2	580-099	Shielded Wire, 16-C-22-SPJ White/Black 1 Cond. 22/19x34 pvc	0.6	
....2	580-130	Wire, Stranded UL1015-20/10 Black Tinned Copper	1.75	
....2	580-133	Wire, UL1061-18/16 #18 Red #M370-2	4.33	
....2	580-134	Wire, UL1061-18/16 #18 Black	1.42	
....2	580-136	Wire, UL1061-18/16 #18 Blue	2.17	
....2	601-2209	WIRE,AWG22,19/34 WHT	31.43	
....2	602-2202	WIRE,TW,AWG22,PVC INS,BLK/RED	0.288	
..1	594-0073	LABEL,WARNING ROTATING FANS	1	
..1	594-0505	LABEL, WARNING-ONLY AUTHORIZED PERSONNEL	1	
..1	700-226-3	Bracket, STL-10/Rec. Rack	2	
..1	700-226-60	AC Receptacle Cover	1	
..1	700-226-61	Cover,Two Stage Power Amplifier	1	
..1	800-285A20M	STL-20M AUDIO PROCESSING BOARD	1	
....2	100-1041	RES,1K OHM,1/4W,1%	1	R23
....2	100-1051	RES,10K OHM,1/4W,1%	3	R4, R9, R10
....2	100-1551	RES,15K OHM,1/4W,1%	1	R7
....2	101-502	POT,5K,SINGLE TURN,HORIZONTAL PCB MOUNT	4	R20, R24, R34, R42
....2	103-1062	RES,100K OHM,1/4W,1%,METAL	3	R18, R26, R37
....2	103-1261	RES,121K OHM,1/4W,1%,METAL	2	R14, R15
....2	103-2211	RES,22.1K OHM,1/4W,1%,METAL	5	R19, R22, R27, R32, R35
....2	103-2945	RES,29.4K OHM,1/4W,1%,METAL	1	R31
....2	103-3924	RES,3.92K OHM,1/4W,1%,METAL	1	R8
....2	103-4741	RES,4.75K OHM,1/4W,1%,METAL	4	R2, R3, R5, R6
....2	103-4755	RES,47.5K OHM,1/4W,1%,METAL	3	R25, R26, R33
....2	103-5365	RES,53.6K OHM,1/4W,1%,METAL	1	R21
....2	145-010	RESISTOR, 1 OHM 1/4 WATT 5% CARBON FILM 29AB250-1	1	R45
....2	145-030	RESISTOR, 3.3 OHM 1/4 WATT 1% METAL FILM MEPCO SFR25	1	R46
....2	145-150-C	Resistor, 15 ohm 1/4 watt 5% carbon comp 30BJ250	1	R13B
....2	145-182-1	RESISTOR, 1.8K OHN 1/4 WATT 1% RL07S182G MF	1	R12B
....2	145-183-1	RESISTOR, 18K OHM 1/4 WATT 1% RL07S183G	2	R28, R29
....2	145-241-1	RESISTOR, 240 OHM 1/4 WATT 1% SFR55 240 1% TR	1	R11
....2	145-431	Resistor, 432 ohm 1/4 watt 1% metal film Mepco SFR25	1	R44

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	145-470	Resistor, 47.5 ohm 1/4 watt 1% metal film Mepco SFR25	1	R49
....2	145-681	RESISTOR, 681 OHM 1/4 WATT 1% METAL FILM MEPCO SFR25	2	R16, R17
....2	145-912-1	RESISTOR, 9.1K OHM 1/4 WATT 1% RL07S912G	1	R30
....2	215-102	CAPACITOR, .001 uFD 2.5% 100V POLYPRO	1	C26
....2	215-151C	Capacitor, 150pF 5% 200V ceramic dipped C322C151J2G5CA	2	C22, C25
....2	215-202	Capacitor, .002 mfd 2.5% 100v polypro Seacor PFWAB200HGEE	1	C27
....2	215-242	CAPACITOR, .0024 UF 2.5% 100V POLYPRO	1	C24
....2	215-301	CAPACITOR, 300 PF 2.5% 100V POLYPRO	1	C21
....2	215-332	Capacitor, 3300 pf 2.5% 100v polypro Seacor PFWAB330HGUE	1	C38
....2	217-103	CAP,0.1UF 250VDC 5%,POLY FILM	1	C8
....2	219-102	CAPACITOR, ELECTROLYTIC 1000uF 16V	3	C2, C4, C7
....2	219-220	CAPACITOR, ELECTROLYTIC 22uF RADIAL 35V	9	C6, C10, C11, C14, C15, C20, C23, C29, C36
....2	219-221	CAPACITOR, ELECTROLYTIC 220uF 25V RADIAL	1	C28
....2	255-100	CAPACITOR, 10 PF 5% NPO DISC	1	C18
....2	255-220	CAPACITOR, 22 pF 5% NPO DISC	1	C41
....2	255-241	Capacitor, 240 pf 500v 5% silver mica CD10FD241J03	1	C5
....2	255-390C	Capacitor, 39pF 5% 200V ceramic dipped C322C390J2G5CA	1	C35
....2	255-470C	CAP, 47pF 5% 200V CERAMIC DIPPED	1	C3
....2	256-131	CAPACITOR, 130 pF 5% 50V NPO DISC	1	C19
....2	270-102	Cap,monolithic,1000pf 50v 5%KemetC1206C102J5GACTR marked	6	C9, C12, C13, C16, C17, C33
....2	340-0004	SW,JUMPER PROGRAMMABLE	4	P5,P6, P3-1, P3-2
....2	400-275	IC, OP-AMP DUAL BIPOLAR/JFET, AUDIO	3	IC1, IC2, IC5
....2	401-338	IC, SMT, REGULATOR, 5 AMP, LM338T *NOTE*	1	IC4
....2	412-494	DIODE, GERMANIUM 1N270 (note)	1	D1
....2	414-007	Diode, General Instruments 1N4007	2	D2, D3
....2	500-162	Screw, 4-40 x 7/16 phillips pan head MS zinc plated"	1	
....2	500-199	Keps nut 4 x 40 zinc 4CNKEOZ	1	
....2	520-051	HEATSINK, THERMALLOY 6030B-TT	1	
....2	550-123	Connector, 10 pin header (cut from 550-162)	2	P1, P2
.....3	550-162	Connector, 24 pin break-away (straight) Molex 26-48-6248	0.417	
....2	550-191	Conn,2 dual pin header(cut from 550-316 Molex 10-89-1801)	1	JP-5/JP-6
.....3	550-316	HEADER, BREAKAWAY 40x2, 0.1 SPACING"	0.05	
....2	550-197	Header, Breakaway 4x2,0.1 Spacing(Cut from 550-316)"	1	JP-3/JP-4
.....3	550-316	HEADER, BREAKAWAY 40x2, 0.1 SPACING"	0.1	
....2	800-285B	PC Board, Audio Processing	1	PCB



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	DB61024	Washer, TO-220 Shoulder NYL Thermalloy #7721-7PPS	1	
....2	DB68027	Sil Pad TO220 .75x.5" ADHSV Berquist 3223-07AC-58"	1	
..1	800-290A	STL-10A/15C/20C/20M Meter Board (SBCM)	1	
....2	030-046M	METER, 60 WATTS, VOLTS/AMPS, VU	1	
....2	101-502	POT,5K,SINGLE TURN,HORIZONTAL PCB MOUNT	1	R5
....2	103-4755	RES,47.5K OHM,1/4W,1%,METAL	1	R6
....2	103-502	POT,5K,SINGLE TURN,VERTICAL PCB MOUNT	3	R8, R9, R10
....2	145-150-C	Resistor, 15 ohm 1/4 watt 5% carbon comp 30BJ250	4	R1, R2, R3, R4
....2	145-431	Resistor, 432 ohm 1/4 watt 1% metal film Mepco SFR25	1	R7
....2	145-562	RESISTOR, 5.6K OHM 1/4 WATT 5% METAL FILM	2	R11, R12
....2	414-007	Diode, General Instruments 1N4007	1	D1
....2	420-4104	SCREW,4-40X.250,S.S. PH	2	
....2	500-055	Lockwasher, #4 internal tooth small pattern zinc plated	4	
....2	500-133	Screw, 4-40 x 5/8 binding head nickel plated"	2	
....2	510-196	SUBMINIATURE LAMP, LUMEX IFL-LX2162-16T	2	B1, B2
....2	513-022	STANDOFF,1/4HEX x 0.375"LONG,4-40"	4	
....2	513-033	Spacer, 4-40 x 13/16 hex threaded Concord 535-8413-02	2	
....2	530-059	SWITCH, ROTARY	1	S1
....2	550-149	Connector, 6 pin Molex angle header (cut from 550-163)	1	P2
.....3	550-163	Connector, 24 pin break-away (angle) Molex 26-48-6246	0.25	
....2	550-176	Connector, 8 pin Molex angle header (cut from 550-163)	1	P1
.....3	550-163	Connector, 24 pin break-away (angle) Molex 26-48-6246	0.333	
....2	550-208	Connector, 3 pin single row header (cut from 550-207)	1	P3
.....3	550-207	Connector, Single row Header Samtec TSW-150-17-T-S-LL	0.177	
....2	580-005	Buss Wire, #22AWG Solid Tinned Copper	0.333	
....2	800-280A	STL-10/15 LED Array Board	1	P3
.....3	100-1051	RES,10K OHM,1/4W,1%	1	R4
.....3	103-1007	RES,1 MEG OHM,1/4W,1%,METAL	1	R1
.....3	103-2241	RES,2.21K OHM,1/4W,1%,METAL	4	R6, R7, R8, R9
.....3	145-302	Resistor, 3k ohm 1/4 watt 1% metal film 29MF250	1	R2
.....3	145-681	RESISTOR, 681 OHM 1/4 WATT 1% METAL FILM MEPCO SFR25	1	R5
.....3	145-823	Resistor, 82.5k ohm 1/4 watt 1% metal film 29MF250	1	R3

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	299-150	Cap.,Tantalum, 1.5 mf 35v ECS-F1VE155K Panasonic P2060-ND	1	C3
.....3	299-220	Capacitor, tantalum, 2.2 mf 25v ECS-F1EE225K Panasonic	1	C1
.....3	299-470	CAP, TANTALUM, 4.7 UF 16V	2	C2, C4
.....3	401-412	INTEGRATED CIRCUIT, SANYO LB1412 (NOTE)	1	IC1
.....3	411-225	LED BAR GRAPH DISPLAY LUMEX SSA-LXH1225-23707	1	D1-D12
.....3	500-120	Eyelet, #1-544047-5 copper	2	
.....3	550-206	Connector, bottom entry Molex 22-14-2034 OR 22-17-2032	1	P1
.....3	800-280B	PC Board, LED Meter STL-10	1	PCB
....2	800-290B	PC Board, Meter STL-15C	1	PCB
..1	800-379ASM	STL-20C/M TRANSMITTER I/O BOARD ASSY	1	
....2	550-186	Connector, 3 pin Molex header (cut from 550-162)	1	P1
.....3	550-162	Connector, 24 pin break-away (straight) Molex 26-48-6248	0.125	
....2	800-379AR	RPU Transmitter I/O Board Assy (SBCM)	1	
.....3	270-102	Cap,monolithic,1000pf 50v 5%KemetC1206C102J5GACTR marked	6	C1, C2, C3, C4, C5, C6
.....3	270-220	Cap, monolithic chip, 22 pf 50v 5% KEMET C1206C220J5GACTR	3	C7, C8, C9
.....3	330-024	Inductor, 10uH SMT DN12103JTR-ND DELEVAN 5%	7	L3, L4, L5, L6, L7, L8, L9
.....3	350-196	Inductor, SMT, Power, 0.68, Coilcraft DO3316P-681HC	2	L1, L2
.....3	500-162	Screw, 4-40 x 7/16 phillips pan head MS zinc plated"	2	
.....3	550-170	Connector, D-Sub 15 pin angle	1	J4
.....3	550-176	Connector, 8 pin Molex angle header (cut from 550-163)	1	P2
.....4	550-163	Connector, 24 pin break-away (angle) Molex 26-48-6246	0.333	
.....3	550-211	Conn,2x8 pin dual row header right angle cut from 550-217	1	P3
.....4	550-217	Dual Right Angle Breakaway Header Amp #571-41033300 40x2	0.2	
.....3	800-379B	PC Board, STL/RPU Transmitter I/O	1	
..1	800-383A	POWER SUPPLY, SWITCHING 15V, 10A	1	
..1	800-387A	STL-20M SYNTHESIZER ADAPTER BOARD ASSEMBLY	1	
....2	417-1606	CONN,HEADER,16-PIN,PCB MOUNT	1	P2
....2	550-328	Conn,Header 8X2,Dual Row Right Angle, 0.1sp-Molex 0719730208	1	J1
....2	800-387B	STL-20M SYNTHESIZER ADAPTER BOARD	1	
..1	800-390A	STL-20C/M ALARM/LED BRD ASSY (SBCM)	1	
....2	185-1.21K	Resistor, SMT, size 1206, 1.21K ohms, Dale CRCW1206-1.21K	1	R1
....2	185-102	Resistor, 1K ohm 1/8 watt 1% chip Dale CRCW1206-1K	2	R11, R14



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	185-103	Resistor, 10K ohm 1/8 watt 1% chip Dale CRCW1206-10K	2	R12, R13
....2	185-392	Resistor, SMT, size 1206, 392 ohms, Dale CRCW1206-392	1	R2
....2	185-475	Resistor, SMT, Size 1206, 475 ohms, Dale CRCW1206-475	8	R3, R4, R5, R6, R7, R8, R9, R10
....2	298-105	Cap SMT 1mF 16V Tantalum Kemet T491A105M016AS	4	C1, C2, C3, C4
....2	400-295	IC,OP-AMP, GENERAL PURPOSE, OP295GS	1	UB
....2	401-164	IC, SMT, 8-Bit Ser In, Par Out SR Phillips 74HC164D	1	U2
....2	401-317	IC, SMT, Regulator,Adjustable, 1.5 Amps,National LM317AEMP	1	U1
....2	401-374	IC, OCTAL D FLIP-FLOP W 3-ST OUT	1	U3
....2	408-402	ICSMT, Digital Pot,2 Ch,100K ohms,Analog Device AD8402AR100	1	U12
....2	410-155	LED, Red rectangular #604-L113HDT	3	D1, D2, D3
....2	410-255	LED, Green rectangular Lumex#SSL-LX2573GD	1	D4
....2	420-141	Transistor, SMT, Darlington, NPN, Mototrola MMBTA14LT1	1	Q5
....2	439-041	TRANSISTOR, SMT, GENERAL PURPOSE, NPN	4	Q1, Q2, Q3, Q4
....2	510-005	Polytube, Manhatten#AF155A-20-yel	0.166	
....2	530-008	Switch, toggle SPDT Apem #5636AB16	1	S1
....2	550-176	Connector, 8 pin Molex angle header (cut from 550-163)	1	P1
.....3	550-163	Connector, 24 pin break-away (angle) Molex 26-48-6246	0.333	
....2	800-390B	STL-20C/M ALARM/LED BRD	1	
..1	800-391A	STL-20 ACCESSORY TERMINAL BUS BOARD (SBCM)	1	
....2	412-1600	BARR STP,16 POS,BEAU	1	TB2
....2	417-1513	RCPT,15 PIN D, FEMALE	1	
....2	800-391B	STL-20 ACCESSORY TERMINAL BUS PCB	1	
..1	800-392A	14.5 VOLT STEP-UP REGULATOR (SBCM)	1	
....2	070-2265-L25	CAP,TANT,22 MFD,20%,25V, E CASE,LOW ESR,SMD	2	C1, C5
....2	185-103	Resistor, 10K ohm 1/8 watt 1% chip Dale CRCW1206-10K	1	R2
....2	185-110K	RESISTOR, SMT, 1206, 110K OHM, 1%	1	R1
....2	185-162K	RES,162K OHM,1%,0.25W,1206	1	R4
....2	185-2.74K	Resistor, SMT, size 1206, 2.74K ohms, Dale CRCW1206-2.74K	1	R7
....2	185-392	Resistor, SMT, size 1206, 392 ohms, Dale CRCW1206-392	1	R6
....2	185-393	Resistor, SMT, 1206, 39.2K ohm 1% Dale CWCR1206-39.2K	1	R5
....2	185-6.81K	Resistor, SMT, 1206, 6.81K Ohm, Dale CRCW1206-6.81K	1	R3
....2	270-101	Cap., monolithic chip, 100 pf 50v 5% Kemet C1206C101J5GAC	1	C4

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	270-102	Cap,monolithic,1000pf 50v 5%KemetC1206C102J5GACTR marked	2	C6, C7
....2	270-682	CAPACITOR, SMT, 1206, 6800 PF, 5%	1	C2
....2	298-105	Cap SMT 1mF 16V Tantalum Kemet T491A105M016AS	1	C8
....2	298-106	Cap., Tantalum, SMT, Size B, 10uF, 16V,Kemet T491B106K016AS	1	C3
....2	340-0004	SW,JUMPER PROGRAMMABLE	1	
....2	350-103P	INDUCTOR, SMT, POWER, 10UH	1	L1
....2	350-201	INDUCTOR, SMT, 1812, 82NH	1	L2
....2	400-196	IC, SMT, 1.5A STEP-UP REGULATOR	1	U1
....2	401-317	IC, SMT, Regulator,Adjustable, 1.5 Amps,National LM317AEMP	1	U2
....2	413-1597	TERM,TURRET,2 SHLDR,.219,GOLD FLASH	4	E1, E2, E3, E4
....2	417-2043	RCPT, 20 POS, 2 ROW, R-ANG, PCB	1	J2
....2	418-120	DIODE, SMT, 1A, SCHOTTKY RECTIFIER	1	D1
....2	550-191	Conn,2 dual pin header(cut from 550-316 Molex 10-89-1801)	1	P1
.....3	550-316	HEADER, BREAKAWAY 40x2, 0.1 SPACING"	0.05	
....2	550-269	Connector,Header 10 Pin RI-10-1 Unsheltered 5x2x1 (note)	1	P4
....2	550-325-16	Conn,16-Pin (cut from 550-325) Right Angle	1	P3
.....3	550-325	CONN, RIGHT ANGLE DUAL ROW 80-PIN	0.2	
....2	800-392B	PCB, 14.5 VOLT STEP-UP REGULATOR	1	



12 STL 20C AND STL 20M SYNTHESIZER AND PAs

This bill of material uses an indented structure to show relationships of parts into sub assemblies.
Example; all BOM LEVEL 2 parts are contained in the BOM LEVEL 1 part immediately above it.

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	800-375AT150	TRANSMITTER SYNTHESIZER ASSY 150	1	
....2	400-185	IC, VCO, 135-185 MHZ	1	
....2	800-375AT	Transmitter Synthesizer Board Assy Generic (SBCM)	1	
.....3	011-7.3728	Crystal,SMT,7.3728 MHz, 50ppm, Epson MA-506-7.3728M-C2	1	X1
.....3	012-280-1	TCXO, SMT, 12.800 MHZ, 1PPM	1	U15
.....3	108-502	Potentiometer, 5K ohms, SMT, Bourns 3224W-1-502E	1	R74
.....3	185-000	Resistor,0 Ohm 1206 Chip Mfg# DALCRCW1206000ZT-X	5	R24, R25, R38, R83, R84
.....3	185-1.62K	Resistor, SMT, 1206, 1.62K Ohm, Dale CRCW1206-1.62K	1	R53
.....3	185-1.82K	RESISTER, SMT, 1206, 1.82K, 1%	2	R50, R51
.....3	185-100	Resistor, 10 Ohm Dale CRCW1206-10 1% Tape & Reel	3	R18, R35, R36
.....3	185-101	RESISTOR, 1/8 W 100 OHM CHIP 5%	2	R59, R78
.....3	185-102	Resistor, 1K ohm 1/8 watt 1% chip Dale CRCW1206-1K	16	R3, R6, R7, R15, R17, R19, R33, R45, R67, R69, R70, R71, R72, R75, R81, R86
.....3	185-103	Resistor, 10K ohm 1/8 watt 1% chip Dale CRCW1206-10K	7	R8, R13, R20, R52, R66, R68, R77
.....3	185-104	Resistor, Dale CRCW1206-100K 100k ohm 1/8 watt 1% chip	1	R16
.....3	185-133	Resistor,SMT,1206,133 ohms,1%	1	R37
.....3	185-150	Resistor, 15 ohm 1/8 watt 5% chip Dale #CRCW1206150JT	1	R27
.....3	185-18.2	RES,18.2 OHM,1%,0.25W,1206	3	R21, R22, R23
.....3	185-2.21K	RES,2.21K OHM,1%,0.25W,1206	1	R73
.....3	185-2.74K	Resistor, SMT, size 1206, 2.74K ohms, Dale CRCW1206-2.74K	3	R1, R30, R60
.....3	185-22.1	Resistor, SMT, size 1206, 22.1 ohms, Dale CRCW1206-22.1	1	R5
.....3	185-22.1K	Resistor, SMT, 1206, 22.1K, Dale CRCW1206-22.1K	1	R76
.....3	185-3.32K	Resistor, SMT, 1206, 3.32K, Dale CRCW1206-3.32K	1	R44
.....3	185-39.2	Resistor, SMT, size 1206, 39.2 ohms, Dale CRCW1206-39.2	2	R28, R29
.....3	185-4.75K	Resistor, SMT, 1206, 4.75K, Dale CRCW1206-4.75K	9	R4, R11, R54, R56, R58, R79, R80, R82, R87
.....3	185-432	Resistor, SMT, size 1206, 432 ohms, Dale CRCW1206-432	1	R14
.....3	185-47.5	Resistor, SMT, size 1206, 47.5 ohms, Dale CRCW1206-47.5	1	R34



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	185-47.5K	Resistor, SMT, size 1206, 47.5K ohms, Dale CRCW1206-47.5K	4	R46, R47, R48, R49
.....3	185-475	Resistor, SMT, Size 1206, 475 ohms, Dale CRCW1206-475	3	R55, R57, R62,
.....3	185-5.11K	Resistor, SMT, size 1206, 5.11K ohms, Dale CRCW1206-5.11K	4	R2, R31, R32, R61
.....3	185-51.1	Resistor, SMT, 1206, 51.1 ohm, Dale CRCW1206-51.1	1	R43
.....3	198-2024	TRMR, 2K OHMS, TOP ADJUST,10 TURN,SMD	1	R63
.....3	270-100	Capacitor, monolithic chip, 10 pf 50v Kemet C1206C100J5GACTR	2	C26
.....3	270-102	Cap,monolithic,1000pf 50v 5%KemetC1206C102J5GACTR marked	14	C6, C9, C16, C18, C27, C28, C29, C31, C44, C45, C50, C51, C52, C61
.....3	270-103	Cap, Monolithic chip 10000pF 10% XR7 Kemet C1206C103J5RACR	7	C19, C25, C30, C33, C39, C43, C55
.....3	270-104	Capacitor, Monolithic Chip 100000pF 1% C1206C104J5RAC Kemet	4	C20, C35, C14, C15
.....3	270-330	Capacitor,monolithic chip,33 pf 50v 5% Kemet C1206C330J5GAC	2	C57, C58
.....3	298-105	Cap SMT 1mF 16V Tantalum Kemet T491A105M016AS	11	C5, C8, C21, C24, C32, C34, C38, C42, C54, C56, C62
.....3	270-407-1	Capacitor,SMT,size 1206,4.7pF,COG,100V Kemet C1206C479C1GAC	1	R26
.....3	298-106	Cap., Tantalum, SMT, Size B, 10uF, 16V,Kemet T491B106K016AS	1	C41
.....3	298-107	Cap.,Tantalum,SMT, Size D, 100uF, 16V,Kemet T491X107K016AS	9	C1, C3, C17, C22, C23, C40, C53, C59, C60
.....3	298-156	Capacitor,Tantalum,SMT,size D, 15uF,25V Kemet T491D156K025AS	2	C10, C12
.....3	298-157	Capacitor,Tantalum,SMT,size X,150uF,16V Kemet T491X157K016AS	2	C11, C13
.....3	298-476	Capacitor,Tantalum,SMT,size D, 47uF,16V Kemet T491D476K016AS	2	C4, C36, C7
.....3	330-024	Inductor, 10uH SMT DN12103JTR-ND DELEVAN 5%	7	L1, L2, L3, L6, L7, L8, L9
.....3	350-191	Inductor, SMT, 1008, 330nH, Coilcraft 1008CS-331XKBC	2	L4, L5
.....3	400-158	IC, SMT, PLL Freq Synth, Serial inp Motorola MC145158DW2	1	U5
.....3	400-495	IC, SMT, OP-AMP, QUAD, RAIL TO RAIL	1	U2
.....3	400-678	IC, SMT, MMIC AMPLIFIER, 2 GHz, BROADBAND	2	U10, U11
.....3	401-275	IC,SMT,OP-AMP,LOW NOISE,HIGH AUDIO BW	2	U7, U8
.....3	401-317	IC, SMT, Regulator,Adjustable, 1.5 Amps,National LM317AEMP	1	U14
.....3	402-054	IC,SMT,Prescaler, Dual Mod, 64/65-128/129 Motorola MC12054AD	1	U4



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	407-376	IC,SMT,Digital Pot,+/-15V,10K Ohms Analog Device AD7376AR10	1	U9
.....3	408-402	ICSMT, Digital Pot,2 Ch,100K ohms,Analog Device AD8402AR100	1	U16
.....3	409-044	IC, SMT, Microcontroller Atmel AT90S4433-8AI (note)	1	U1
.....3	415-840	Diode, Zener, SMT, 13V, Vishay BZX84C13TR	1	D1
.....3	418-447	Diode, SMT, Zener, 4.7V, Motorola BZX84C4V7LT1	1	D3
.....3	418-451	Diode, SMT, Zener, 5.1V Motorola BZX84C5V1LT1	2	D2, D4
.....3	420-141	Transistor, SMT, Darlington, NPN, Mototrola MMBTA14LT1	5	Q1, Q2, Q3, Q4, Q5
.....3	439-041	TRANSISTOR, SMT, GENERAL PURPOSE, NPN	3	Q7, Q8, Q9
.....3	550-193	CONNECTOR, S.FL2-R-SMT SURFACE MOUNT	1	J1
.....3	550-325-16	Conn,16-Pin (cut from 550-325) Right Angle	1	P1
.....4	550-325	CONN, RIGHT ANGLE DUAL ROW 80-PIN	0.2	
.....3	550-325-20	Conn,20-Pin (cut from 550-325) Right Angle	1	P2
.....4	550-325	CONN, RIGHT ANGLE DUAL ROW 80-PIN	0.25	
.....3	700-0119	TAPE,KAPTON 1/4	0.001	
.....3	700-226-63	Exterior Fencing&Cover,Synth Leader Tech88-CBSU-2.25x5.75x.8	1	
.....3	800-375B	PC Board, Transmitter Synthesizer,	1	
....2	800-375ATSW2	RPU/STL XMIT SYN SW VERSION 2	1	

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	800-375AT230	TRANSMITTER SYNTHESIZER ASSY 230	1	
....2	400-265	IC, VCO, 215-265 MHZ, SYNERGY	1	
....2	800-375AT	Transmitter Synthesizer Board Assy Generic (SBCM)	1	
.....3	011-7.3728	Crystal,SMT,7.3728 MHz, 50ppm, Epson MA-506-7.3728M-C2	1	X1
.....3	012-280-1	TCXO, SMT, 12.800 MHZ, 1PPM	1	U15
.....3	108-502	Potentiometer, 5K ohms, SMT, Bourns 3224W-1-502E	1	R74
.....3	185-000	Resistor,0 Ohm 1206 Chip Mfg# DALCRCW1206000ZT-X	5	R24, R25, R38, R83, R84
.....3	185-1.62K	Resistor, SMT, 1206, 1.62K Ohm, Dale CRCW1206-1.62K	1	R53
.....3	185-1.82K	RESISTER, SMT, 1206, 1.82K, 1%	2	R50, R51
.....3	185-100	Resistor, 10 Ohm Dale CRCW1206-10 1% Tape & Reel	3	R18, R35, R36
.....3	185-101	RESISTOR, 1/8 W 100 OHM CHIP 5%	2	R59, R78
.....3	185-102	Resistor, 1K ohm 1/8 watt 1% chip Dale CRCW1206-1K	16	R3, R6, R7, R15, R17, R19, R33, R45, R67, R69, R70, R71, R72, R75, R81, R86
.....3	185-103	Resistor, 10K ohm 1/8 watt 1% chip Dale CRCW1206-10K	7	R8, R13, R20, R52, R66, R68, R77
.....3	185-104	Resistor, Dale CRCW1206-100K 100k ohm 1/8 watt 1% chip	1	R16
.....3	185-133	Resistor,SMT,1206,133 ohms,1%	1	R37
.....3	185-150	Resistor, 15 ohm 1/8 watt 5% chip Dale #CRCW1206150JT	1	R27
.....3	185-18.2	RES,18.2 OHM,1%,0.25W,1206	3	R21, R22, R23
.....3	185-2.21K	RES,2.21K OHM,1%,0.25W,1206	1	R73
.....3	185-2.74K	Resistor, SMT, size 1206, 2.74K ohms, Dale CRCW1206-2.74K	3	R1, R30, R60
.....3	185-22.1	Resistor, SMT, size 1206, 22.1 ohms, Dale CRCW1206-22.1	1	R5
.....3	185-22.1K	Resistor, SMT, 1206, 22.1K, Dale CRCW1206-22.1K	1	R76
.....3	185-3.32K	Resistor, SMT, 1206, 3.32K, Dale CRCW1206-3.32K	1	R44
.....3	185-39.2	Resistor, SMT, size 1206, 39.2 ohms, Dale CRCW1206-39.2	2	R28, R29
.....3	185-4.75K	Resistor, SMT, 1206, 4.75K, Dale CRCW1206-4.75K	9	R4, R11, R54, R56, R58, R79, R80, R82, R87
.....3	185-432	Resistor, SMT, size 1206, 432 ohms, Dale CRCW1206-432	1	R14
.....3	185-47.5	Resistor, SMT, size 1206, 47.5 ohms, Dale CRCW1206-47.5	1	R34
.....3	185-47.5K	Resistor, SMT, size 1206, 47.5K ohms, Dale CRCW1206-47.5K	4	R46, R47, R48, R49
.....3	185-475	Resistor, SMT, Size 1206, 475 ohms, Dale CRCW1206-475	3	R55, R57, R62,
.....3	185-5.11K	Resistor, SMT, size 1206, 5.11K ohms, Dale CRCW1206-5.11K	4	R2, R31, R32, R61



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	185-51.1	Resistor, SMT, 1206, 51.1 ohm, Dale CRCW1206-51.1	1	R43
.....3	198-2024	TRMR, 2K OHMS, TOP ADJUST,10 TURN,SMD	1	R63
.....3	270-100	Capacitor, monolithic chip, 10 pf 50v Kemet C1206C100J5GACTR	2	C26
.....3	270-102	Cap,monolithic,1000pf 50v 5%KemetC1206C102J5GACTR marked	14	C6, C9, C16, C18, C27, C28, C29, C31, C44, C45, C50, C51, C52, C61
.....3	270-103	Cap, Monolithic chip 10000pF 10% XR7 Kemet C1206C103J5RACR	7	C19, C25, C30, C33, C39, C43, C55
.....3	270-104	Capacitor, Monolithic Chip 100000pF 1% C1206C104J5RAC Kemet	4	C20, C35, C14, C15
.....3	270-330	Capacitor,monolithic chip,33 pf 50v 5% Kemet C1206C330J5GAC	2	C57, C58
.....3	270-407-1	Capacitor,SMT,size 1206,4.7pF,COG,100V Kemet C1206C479C1GAC	1	R26
.....3	298-105	Cap SMT 1mF 16V Tantalum Kemet T491A105M016AS	11	C5, C8, C21, C24, C32, C34, C38, C42, C54, C56, C62
.....3	298-106	Cap., Tantalum, SMT, Size B, 10uF, 16V,Kemet T491B106K016AS	1	C41
.....3	298-107	Cap.,Tantalum,SMT, Size D, 100uF, 16V,Kemet T491X107K016AS	9	C1, C3, C17, C22, C23, C40, C53, C59, C60
.....3	298-156	Capacitor,Tantalum,SMT,size D, 15uF,25V Kemet T491D156K025AS	2	C10, C12
.....3	298-157	Capacitor,Tantalum,SMT,size X,150uF,16V Kemet T491X157K016AS	2	C11, C13
.....3	298-476	Capacitor,Tantalum,SMT,size D, 47uF,16V Kemet T491D476K016AS	2	C4, C36, C7
.....3	330-024	Inductor, 10uH SMT DN12103JTR-ND DELEVAN 5%	7	L1, L2, L3, L6, L7, L8, L9
.....3	350-191	Inductor, SMT, 1008, 330nH, Coilcraft 1008CS-331XKBC	2	L4, L5
.....3	400-158	IC, SMT, PLL Freq Synth, Serial inp Motorola MC145158DW2	1	U5
.....3	400-495	IC, SMT, OP-AMP, QUAD, RAIL TO RAIL	1	U2
.....3	400-678	IC, SMT, MMIC AMPLIFIER, 2 GHz, BROADBAND	2	U10, U11
.....3	401-275	IC,SMT,OP-AMP,LOW NOISE,HIGH AUDIO BW	2	U7, U8
.....3	401-317	IC, SMT, Regulator,Adjustable, 1.5 Amps,National LM317AEMP	1	U14
.....3	402-054	IC,SMT,Prescaler, Dual Mod, 64/65-128/129 Motorola MC12054AD	1	U4
.....3	407-376	IC,SMT,Digital Pot,+/-15V,10K Ohms Analog Device AD7376AR10	1	U9
.....3	408-402	ICSMT, Digital Pot,2 Ch,100K ohms,Analog Device AD8402AR100	1	U16
.....3	409-044	IC, SMT, Microcontroller Atmel AT90S4433-8AI (note)	1	U1

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	415-840	Diode, Zener, SMT, 13V, Vishay BZX84C13TR	1	D1
.....3	418-447	Diode, SMT, Zener, 4.7V, Motorola BZX84C4V7LT1	1	D3
.....3	418-451	Diode, SMT, Zener, 5.1V Motorola BZX84C5V1LT1	2	D2, D4
.....3	420-141	Transistor, SMT, Darlington, NPN, Motorola MMBTA14LT1	5	Q1, Q2, Q3, Q4, Q5
.....3	439-041	TRANSISTOR, SMT, GENERAL PURPOSE, NPN	3	Q7, Q8, Q9
.....3	550-193	CONNECTOR, S.FL2-R-SMT SURFACE MOUNT	1	J1
.....3	550-325-16	Conn,16-Pin (cut from 550-325) Right Angle	1	P1
.....4	550-325	CONN, RIGHT ANGLE DUAL ROW 80-PIN	0.2	
.....3	550-325-20	Conn,20-Pin (cut from 550-325) Right Angle	1	P2
.....4	550-325	CONN, RIGHT ANGLE DUAL ROW 80-PIN	0.25	
.....3	700-0119	TAPE,KAPTON 1/4	0.001	
.....3	700-226-63	Exterior Fencing&Cover,Synth Leader Tech88-CBSU-2.25x5.75x.8	1	
.....3	800-375B	PC Board, Transmitter Synthesizer,	1	
....2	800-375ATSW2	RPU/STL XMIT SYN SW VERSION 2	1	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	800-375AT250	TRANSMITTER SYNTHESIZER ASSY 250	1	
....2	400-265	IC, VCO, 215-265 MHZ, SYNERGY	1	
....2	800-375AT	Transmitter Synthesizer Board Assy Generic (SBCM)	1	
.....3	011-7.3728	Crystal,SMT,7.3728 MHz, 50ppm, Epson MA-506-7.3728M-C2	1	X1
.....3	012-280-1	TCXO, SMT, 12.800 MHZ, 1PPM	1	U15
.....3	108-502	Potentiometer, 5K ohms, SMT, Bourns 3224W-1-502E	1	R74
.....3	185-000	Resistor,0 Ohm 1206 Chip Mfg# DALCRCW1206000ZT-X	5	R24, R25, R38, R83, R84
.....3	185-1.62K	Resistor, SMT, 1206, 1.62K Ohm, Dale CRCW1206-1.62K	1	R53
.....3	185-1.82K	RESISTER, SMT, 1206, 1.82K, 1%	2	R50, R51
.....3	185-100	Resistor, 10 Ohm Dale CRCW1206-10 1% Tape & Reel	3	R18, R35, R36
.....3	185-101	RESISTOR, 1/8 W 100 OHM CHIP 5%	2	R59, R78
.....3	185-102	Resistor, 1K ohm 1/8 watt 1% chip Dale CRCW1206-1K	16	R3, R6, R7, R15, R17, R19, R33, R45, R67, R69, R70, R71, R72, R75, R81, R86
.....3	185-103	Resistor, 10K ohm 1/8 watt 1% chip Dale CRCW1206-10K	7	R8, R13, R20, R52, R66, R68, R77
.....3	185-104	Resistor, Dale CRCW1206-100K 100k ohm 1/8 watt 1% chip	1	R16
.....3	185-133	Resistor,SMT,1206,133 ohms,1%	1	R37
.....3	185-150	Resistor, 15 ohm 1/8 watt 5% chip Dale #CRCW1206150JT	1	R27
.....3	185-18.2	RES,18.2 OHM,1%,0.25W,1206	3	R21, R22, R23
.....3	185-2.21K	RES,2.21K OHM,1%,0.25W,1206	1	R73
.....3	185-2.74K	Resistor, SMT, size 1206, 2.74K ohms, Dale CRCW1206-2.74K	3	R1, R30, R60
.....3	185-22.1	Resistor, SMT, size 1206, 22.1 ohms, Dale CRCW1206-22.1	1	R5
.....3	185-22.1K	Resistor, SMT, 1206, 22.1K, Dale CRCW1206-22.1K	1	R76
.....3	185-3.32K	Resistor, SMT, 1206, 3.32K, Dale CRCW1206-3.32K	1	R44
.....3	185-39.2	Resistor, SMT, size 1206, 39.2 ohms, Dale CRCW1206-39.2	2	R28, R29
.....3	185-4.75K	Resistor, SMT, 1206, 4.75K, Dale CRCW1206-4.75K	9	R4, R11, R54, R56, R58, R79, R80, R82, R87
.....3	185-432	Resistor, SMT, size 1206, 432 ohms, Dale CRCW1206-432	1	R14
.....3	185-47.5	Resistor, SMT, size 1206, 47.5 ohms, Dale CRCW1206-47.5	1	R34
.....3	185-47.5K	Resistor, SMT, size 1206, 47.5K ohms, Dale CRCW1206-47.5K	4	R46, R47, R48, R49
.....3	185-475	Resistor, SMT, Size 1206, 475 ohms, Dale CRCW1206-475	3	R55, R57, R62,

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	185-5.11K	Resistor, SMT, size 1206, 5.11K ohms, Dale CRCW1206-5.11K	4	R2, R31, R32, R61
.....3	185-51.1	Resistor, SMT, 1206, 51.1 ohm, Dale CRCW1206-51.1	1	R43
.....3	198-2024	TRMR, 2K OHMS, TOP ADJUST,10 TURN,SMD	1	R63
.....3	270-100	Capacitor, monolithic chip, 10 pf 50v Kemet C1206C100J5GACTR	2	C26
.....3	270-102	Cap,monolithic,1000pf 50v 5%KemetC1206C102J5GACTR marked	14	C6, C9, C16, C18, C27, C28, C29, C31, C44, C45, C50, C51, C52, C61
.....3	270-103	Cap, Monolithic chip 10000pF 10% XR7 Kemet C1206C103J5RACR	7	C19, C25, C30, C33, C39, C43, C55
.....3	270-104	Capacitor, Monolithic Chip 100000pF 1% C1206C104J5RAC Kemet	4	C20, C35, C14, C15
.....3	270-330	Capacitor,monolithic chip,33 pf 50v 5% Kemet C1206C330J5GAC	2	C57, C58
.....3	270-407-1	Capacitor,SMT,size 1206,4.7pF,COG,100V Kemet C1206C479C1GAC	1	R26
.....3	298-105	Cap SMT 1mF 16V Tantalum Kemet T491A105M016AS	11	C5, C8, C21, C24, C32, C34, C38, C42, C54, C56, C62
.....3	298-106	Cap., Tantalum, SMT, Size B, 10uF, 16V,Kemet T491B106K016AS	1	C41
.....3	298-107	Cap.,Tantalum,SMT, Size D, 100uF, 16V,Kemet T491X107K016AS	9	C1, C3, C17, C22, C23, C40, C53, C59, C60
.....3	298-156	Capacitor,Tantalum,SMT,size D, 15uF,25V Kemet T491D156K025AS	2	C10, C12
.....3	298-157	Capacitor,Tantalum,SMT,size X,150uF,16V Kemet T491X157K016AS	2	C11, C13
.....3	298-476	Capacitor,Tantalum,SMT,size D, 47uF,16V Kemet T491D476K016AS	2	C4, C36, C7
.....3	330-024	Inductor, 10uH SMT DN12103JTR-ND DELEVAN 5%	7	L1, L2, L3, L6, L7, L8, L9
.....3	350-191	Inductor, SMT, 1008, 330nH, Coilcraft 1008CS-331XKBC	2	L4, L5
.....3	400-158	IC, SMT, PLL Freq Synth, Serial inp Motorola MC145158DW2	1	U5
.....3	400-495	IC, SMT, OP-AMP, QUAD, RAIL TO RAIL	1	U2
.....3	400-678	IC, SMT, MMIC AMPLIFIER, 2 GHz, BROADBAND	2	U10, U11
.....3	401-275	IC,SMT,OP-AMP,LOW NOISE,HIGH AUDIO BW	2	U7, U8
.....3	401-317	IC, SMT, Regulator,Adjustable, 1.5 Amps,National LM317AEMP	1	U14
.....3	402-054	IC,SMT,Prescaler, Dual Mod, 64/65-128/129 Motorola MC12054AD	1	U4
.....3	407-376	IC,SMT,Digital Pot,+/-15V,10K Ohms Analog Device AD7376AR10	1	U9
.....3	408-402	ICSMT, Digital Pot,2 Ch,100K ohms,Analog Device AD8402AR100	1	U16



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	409-044	IC, SMT, Microcontroller Atmel AT90S4433-8AI (note)	1	U1
.....3	415-840	Diode, Zener, SMT, 13V, Vishay BZX84C13TR	1	D1
.....3	418-447	Diode, SMT, Zener, 4.7V, Motorola BZX84C4V7LT1	1	D3
.....3	418-451	Diode, SMT, Zener, 5.1V Motorola BZX84C5V1LT1	2	D2, D4
.....3	420-141	Transistor, SMT, Darlington, NPN, Mototrola MMBTA14LT1	5	Q1, Q2, Q3, Q4, Q5
.....3	439-041	TRANSISTOR, SMT, GENERAL PURPOSE, NPN	3	Q7, Q8, Q9
.....3	550-193	CONNECTOR, S.FL2-R-SMT SURFACE MOUNT	1	J1
.....3	550-325-16	Conn,16-Pin (cut from 550-325) Right Angle	1	P1
.....4	550-325	CONN, RIGHT ANGLE DUAL ROW 80-PIN	0.2	
.....3	550-325-20	Conn,20-Pin (cut from 550-325) Right Angle	1	P2
.....4	550-325	CONN, RIGHT ANGLE DUAL ROW 80-PIN	0.25	
.....3	700-0119	TAPE,KAPTON 1/4	0.001	
.....3	700-226-63	Exterior Fencing&Cover,Synth Leader Tech88-CBSU-2.25x5.75x.8	1	
.....3	800-375B	PC Board, Transmitter Synthesizer,	1	
....2	800-375ATSW2	RPU/STL XMIT SYN SW VERSION 2	1	

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	800-375AT330	TRANSMITTER SYNTHESIZER ASSY 330	1	
....2	400-351	IC, VCO, 300-350 MHZ	1	
....2	800-375AT	Transmitter Synthesizer Board Assy Generic (SBCM)	1	
.....3	011-7.3728	Crystal,SMT,7.3728 MHz, 50ppm, Epson MA-506-7.3728M-C2	1	X1
.....3	012-280-1	TCXO, SMT, 12.800 MHZ, 1PPM	1	U15
.....3	108-502	Potentiometer, 5K ohms, SMT, Bourns 3224W-1-502E	1	R74
.....3	185-000	Resistor,0 Ohm 1206 Chip Mfg# DALCRCW1206000ZT-X	5	R24, R25, R38, R83, R84
.....3	185-1.62K	Resistor, SMT, 1206, 1.62K Ohm, Dale CRCW1206-1.62K	1	R53
.....3	185-1.82K	RESISTER, SMT, 1206, 1.82K, 1%	2	R50, R51
.....3	185-100	Resistor, 10 Ohm Dale CRCW1206-10 1% Tape & Reel	3	R18, R35, R36
.....3	185-101	RESISTOR, 1/8 W 100 OHM CHIP 5%	2	R59, R78
.....3	185-102	Resistor, 1K ohm 1/8 watt 1% chip Dale CRCW1206-1K	16	R3, R6, R7, R15, R17, R19, R33, R45, R67, R69, R70, R71, R72, R75, R81, R86
.....3	185-103	Resistor, 10K ohm 1/8 watt 1% chip Dale CRCW1206-10K	7	R8, R13, R20, R52, R66, R68, R77
.....3	185-104	Resistor, Dale CRCW1206-100K 100k ohm 1/8 watt 1% chip	1	R16
.....3	185-133	Resistor,SMT,1206,133 ohms,1%	1	R37
.....3	185-150	Resistor, 15 ohm 1/8 watt 5% chip Dale #CRCW1206150JT	1	R27
.....3	185-18.2	RES,18.2 OHM,1%,0.25W,1206	3	R21, R22, R23
.....3	185-2.21K	RES,2.21K OHM,1%,0.25W,1206	1	R73
.....3	185-2.74K	Resistor, SMT, size 1206, 2.74K ohms, Dale CRCW1206-2.74K	3	R1, R30, R60
.....3	185-22.1	Resistor, SMT, size 1206, 22.1 ohms, Dale CRCW1206-22.1	1	R5
.....3	185-22.1K	Resistor, SMT, 1206, 22.1K, Dale CRCW1206-22.1K	1	R76
.....3	185-3.32K	Resistor, SMT, 1206, 3.32K, Dale CRCW1206-3.32K	1	R44
.....3	185-39.2	Resistor, SMT, size 1206, 39.2 ohms, Dale CRCW1206-39.2	2	R28, R29
.....3	185-4.75K	Resistor, SMT, 1206, 4.75K, Dale CRCW1206-4.75K	9	R4, R11, R54, R56, R58, R79, R80, R82, R87
.....3	185-432	Resistor, SMT, size 1206, 432 ohms, Dale CRCW1206-432	1	R14
.....3	185-47.5	Resistor, SMT, size 1206, 47.5 ohms, Dale CRCW1206-47.5	1	R34
.....3	185-47.5K	Resistor, SMT, size 1206, 47.5K ohms, Dale CRCW1206-47.5K	4	R46, R47, R48, R49
.....3	185-475	Resistor, SMT, Size 1206, 475 ohms, Dale CRCW1206-475	3	R55, R57, R62,
.....3	185-5.11K	Resistor, SMT, size 1206, 5.11K ohms, Dale CRCW1206-5.11K	4	R2, R31, R32, R61



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	185-51.1	Resistor, SMT, 1206, 51.1 ohm, Dale CRCW1206-51.1	1	R43
.....3	198-2024	TRMR, 2K OHMS, TOP ADJUST,10 TURN,SMD	1	R63
.....3	270-100	Capacitor, monolithic chip, 10 pf 50v Kemet C1206C100J5GACTR	2	C26
.....3	270-102	Cap,monolithic,1000pf 50v 5%KemetC1206C102J5GACTR marked	14	C6, C9, C16, C18, C27, C28, C29, C31, C44, C45, C50, C51, C52, C61
.....3	270-103	Cap, Monolithic chip 10000pF 10% XR7 Kemet C1206C103J5RACR	7	C19, C25, C30, C33, C39, C43, C55
.....3	270-104	Capacitor, Monolithic Chip 100000pF 1% C1206C104J5RAC Kemet	4	C20, C35, C14, C15
.....3	270-330	Capacitor,monolithic chip,33 pf 50v 5% Kemet C1206C330J5GAC	2	C57, C58
.....3	270-407-1	Capacitor,SMT,size 1206,4.7pF,COG,100V Kemet C1206C479C1GAC	1	R26
.....3	298-105	Cap SMT 1mF 16V Tantalum Kemet T491A105M016AS	11	C5, C8, C21, C24, C32, C34, C38, C42, C54, C56, C62
.....3	298-106	Cap., Tantalum, SMT, Size B, 10uF, 16V,Kemet T491B106K016AS	1	C41
.....3	298-107	Cap.,Tantalum,SMT, Size D, 100uF, 16V,Kemet T491X107K016AS	9	C1, C3, C17, C22, C23, C40, C53, C59, C60
.....3	298-156	Capacitor,Tantalum,SMT,size D, 15uF,25V Kemet T491D156K025AS	2	C10, C12
.....3	298-157	Capacitor,Tantalum,SMT,size X,150uF,16V Kemet T491X157K016AS	2	C11, C13
.....3	298-476	Capacitor,Tantalum,SMT,size D, 47uF,16V Kemet T491D476K016AS	2	C4, C36, C7
.....3	330-024	Inductor, 10uH SMT DN12103JTR-ND DELEVAN 5%	7	L1, L2, L3, L6, L7, L8, L9
.....3	350-191	Inductor, SMT, 1008, 330nH, Coilcraft 1008CS-331XKBC	2	L4, L5
.....3	400-158	IC, SMT, PLL Freq Synth, Serial inp Motorola MC145158DW2	1	U5
.....3	400-495	IC, SMT, OP-AMP, QUAD, RAIL TO RAIL	1	U2
.....3	400-678	IC, SMT, MMIC AMPLIFIER, 2 GHz, BROADBAND	2	U10, U11
.....3	401-275	IC,SMT,OP-AMP,LOW NOISE,HIGH AUDIO BW	2	U7, U8
.....3	401-317	IC, SMT, Regulator,Adjustable, 1.5 Amps,National LM317AEMP	1	U14
.....3	402-054	IC,SMT,Prescaler, Dual Mod, 64/65-128/129 Motorola MC12054AD	1	U4
.....3	407-376	IC,SMT,Digital Pot,+/-15V,10K Ohms Analog Device AD7376AR10	1	U9
.....3	408-402	ICSMT, Digital Pot,2 Ch,100K ohms,Analog Device AD8402AR100	1	U16
.....3	409-044	IC, SMT, Microcontroller Atmel AT90S4433-8AI (note)	1	U1

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	415-840	Diode, Zener, SMT, 13V, Vishay BZX84C13TR	1	D1
.....3	418-447	Diode, SMT, Zener, 4.7V, Motorola BZX84C4V7LT1	1	D3
.....3	418-451	Diode, SMT, Zener, 5.1V Motorola BZX84C5V1LT1	2	D2, D4
.....3	420-141	Transistor, SMT, Darlington, NPN, Motorola MMBTA14LT1	5	Q1, Q2, Q3, Q4, Q5
.....3	439-041	TRANSISTOR, SMT, GENERAL PURPOSE, NPN	3	Q7, Q8, Q9
.....3	550-193	CONNECTOR, S.FL2-R-SMT SURFACE MOUNT	1	J1
.....3	550-325-16	Conn,16-Pin (cut from 550-325) Right Angle	1	P1
.....4	550-325	CONN, RIGHT ANGLE DUAL ROW 80-PIN	0.2	
.....3	550-325-20	Conn,20-Pin (cut from 550-325) Right Angle	1	P2
.....4	550-325	CONN, RIGHT ANGLE DUAL ROW 80-PIN	0.25	
.....3	700-0119	TAPE,KAPTON 1/4	0.001	
.....3	700-226-63	Exterior Fencing&Cover,Synth Leader Tech88-CBSU-2.25x5.75x.8	1	
.....3	800-375B	PC Board, Transmitter Synthesizer,	1	
....2	800-375ATSW2	RPU/STL XMIT SYN SW VERSION 2	1	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	800-375AT450	TRANSMITTER SYNTHESIZER ASSEMBLY 450 MHZ	1	
....2	400-480	IC, VCO, 430-480 Mhz	1	U6
....2	800-375AT	Transmitter Synthesizer Board Assy Generic (SBCM)	1	
.....3	011-7.3728	Crystal,SMT,7.3728 MHz, 50ppm, Epson MA-506-7.3728M-C2	1	X1
.....3	012-280-1	TCXO, SMT, 12.800 MHZ, 1PPM	1	U15
.....3	108-502	Potentiometer, 5K ohms, SMT, Bourns 3224W-1-502E	1	R74
.....3	185-000	Resistor,0 Ohm 1206 Chip Mfg# DALCRCW1206000ZT-X	5	R24, R25, R38, R83, R84
.....3	185-1.62K	Resistor, SMT, 1206, 1.62K Ohm, Dale CRCW1206-1.62K	1	R53
.....3	185-1.82K	RESISTER, SMT, 1206, 1.82K, 1%	2	R50, R51
.....3	185-100	Resistor, 10 Ohm Dale CRCW1206-10 1% Tape & Reel	3	R18, R35, R36
.....3	185-101	RESISTOR, 1/8 W 100 OHM CHIP 5%	2	R59, R78
.....3	185-102	Resistor, 1K ohm 1/8 watt 1% chip Dale CRCW1206-1K	16	R3, R6, R7, R15, R17, R19, R33, R45, R67, R69, R70, R71, R72, R75, R81, R86
.....3	185-103	Resistor, 10K ohm 1/8 watt 1% chip Dale CRCW1206-10K	7	R8, R13, R20, R52, R66, R68, R77
.....3	185-104	Resistor, Dale CRCW1206-100K 100k ohm 1/8 watt 1% chip	1	R16
.....3	185-133	Resistor,SMT,1206,133 ohms,1%	1	R37
.....3	185-150	Resistor, 15 ohm 1/8 watt 5% chip Dale #CRCW1206150JT	1	R27
.....3	185-18.2	RES,18.2 OHM,1%,0.25W,1206	3	R21, R22, R23
.....3	185-2.21K	RES,2.21K OHM,1%,0.25W,1206	1	R73
.....3	185-2.74K	Resistor, SMT, size 1206, 2.74K ohms, Dale CRCW1206-2.74K	3	R1, R30, R60
.....3	185-22.1	Resistor, SMT, size 1206, 22.1 ohms, Dale CRCW1206-22.1	1	R5
.....3	185-22.1K	Resistor, SMT, 1206, 22.1K, Dale CRCW1206-22.1K	1	R76
.....3	185-3.32K	Resistor, SMT, 1206, 3.32K, Dale CRCW1206-3.32K	1	R44
.....3	185-39.2	Resistor, SMT, size 1206, 39.2 ohms, Dale CRCW1206-39.2	2	R28, R29
.....3	185-4.75K	Resistor, SMT, 1206, 4.75K, Dale CRCW1206-4.75K	9	R4, R11, R54, R56, R58, R79, R80, R82, R87
.....3	185-432	Resistor, SMT, size 1206, 432 ohms, Dale CRCW1206-432	1	R14
.....3	185-47.5	Resistor, SMT, size 1206, 47.5 ohms, Dale CRCW1206-47.5	1	R34
.....3	185-47.5K	Resistor, SMT, size 1206, 47.5K ohms, Dale CRCW1206-47.5K	4	R46, R47, R48, R49

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	185-475	Resistor, SMT, Size 1206, 475 ohms, Dale CRCW1206-475	3	R55, R57, R62,
.....3	185-5.11K	Resistor, SMT, size 1206, 5.11K ohms, Dale CRCW1206-5.11K	4	R2, R31, R32, R61
.....3	185-51.1	Resistor, SMT, 1206, 51.1 ohm, Dale CRCW1206-51.1	1	R43
.....3	198-2024	TRMR, 2K OHMS, TOP ADJUST,10 TURN,SMD	1	R63
.....3	270-100	Capacitor, monolithic chip, 10 pf 50v Kemet C1206C100J5GACTR	2	C26
.....3	270-102	Cap,monolithic,1000pf 50v 5%KemetC1206C102J5GACTR marked	14	C6, C9, C16, C18, C27, C28, C29, C31, C44, C45, C50, C51, C52, C61
.....3	270-103	Cap, Monolithic chip 10000pF 10% XR7 Kemet C1206C103J5RACR	7	C19, C25, C30, C33, C39, C43, C55
.....3	270-104	Capacitor, Monolithic Chip 100000pF 1% C1206C104J5RAC Kemet	4	C20, C35, C14, C15
.....3	270-330	Capacitor,monolithic chip,33 pf 50v 5% Kemet C1206C330J5GAC	2	C57, C58
.....3	270-407-1	Capacitor,SMT,size 1206,4.7pF,COG,100V Kemet C1206C479C1GAC	1	R26
.....3	298-105	Cap SMT 1mF 16V Tantalum Kemet T491A105M016AS	11	C5, C8, C21, C24, C32, C34, C38, C42, C54, C56, C62
.....3	298-106	Cap., Tantalum, SMT, Size B, 10uF, 16V,Kemet T491B106K016AS	1	C41
.....3	298-107	Cap.,Tantalum,SMT, Size D, 100uF, 16V,Kemet T491X107K016AS	9	C1, C3, C17, C22, C23, C40, C53, C59, C60
.....3	298-156	Capacitor,Tantalum,SMT,size D, 15uF,25V Kemet T491D156K025AS	2	C10, C12
.....3	298-157	Capacitor,Tantalum,SMT,size X,150uF,16V Kemet T491X157K016AS	2	C11, C13
.....3	298-476	Capacitor,Tantalum,SMT,size D, 47uF,16V Kemet T491D476K016AS	2	C4, C36, C7
.....3	330-024	Inductor, 10uH SMT DN12103JTR-ND DELEVAN 5%	7	L1, L2, L3, L6, L7, L8, L9
.....3	350-191	Inductor, SMT, 1008, 330nH, Coilcraft 1008CS-331XKBC	2	L4, L5
.....3	400-158	IC, SMT, PLL Freq Synth, Serial inp Motorola MC145158DW2	1	U5
.....3	400-495	IC, SMT, OP-AMP, QUAD, RAIL TO RAIL	1	U2
.....3	400-678	IC, SMT, MMIC AMPLIFIER, 2 GHz, BROADBAND	2	U10, U11
.....3	401-275	IC,SMT,OP-AMP,LOW NOISE,HIGH AUDIO BW	2	U7, U8
.....3	401-317	IC, SMT, Regulator,Adjustable, 1.5 Amps,National LM317AEMP	1	U14
.....3	402-054	IC,SMT,Prescaler, Dual Mod, 64/65-128/129 Motorola MC12054AD	1	U4
.....3	407-376	IC,SMT,Digital Pot,+/-15V,10K Ohms Analog Device AD7376AR10	1	U9



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	408-402	ICSMT, Digital Pot,2 Ch,100K ohms,Analog Device AD8402AR100	1	U16
.....3	409-044	IC, SMT, Microcontroller Atmel AT90S4433-8AI (note)	1	U1
.....3	415-840	Diode, Zener, SMT, 13V, Vishay BZX84C13TR	1	D1
.....3	418-447	Diode, SMT, Zener, 4.7V, Motorola BZX84C4V7LT1	1	D3
.....3	418-451	Diode, SMT, Zener, 5.1V Motorola BZX84C5V1LT1	2	D2, D4
.....3	420-141	Transistor, SMT, Darlington, NPN, Motorola MMBTA14LT1	5	Q1, Q2, Q3, Q4, Q5
.....3	439-041	TRANSISTOR, SMT, GENERAL PURPOSE, NPN	3	Q7, Q8, Q9
.....3	550-193	CONNECTOR, S.FL2-R-SMT SURFACE MOUNT	1	J1
.....3	550-325-16	Conn,16-Pin (cut from 550-325) Right Angle	1	P1
.....4	550-325	CONN, RIGHT ANGLE DUAL ROW 80-PIN	0.2	
.....3	550-325-20	Conn,20-Pin (cut from 550-325) Right Angle	1	P2
.....4	550-325	CONN, RIGHT ANGLE DUAL ROW 80-PIN	0.25	
.....3	700-0119	TAPE,KAPTON 1/4	0.001	
.....3	700-226-63	Exterior Fencing&Cover,Synth Leader Tech88-CBSU-2.25x5.75x.8	1	
.....3	800-375B	PC Board, Transmitter Synthesizer,	1	
....2	800-375ATSW2	RPU/STL XMIT SYN SW VERSION 2	1	

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
0	800-375AT950	TRANSMITTER SYNTHESIZER ASSEMBLY 950 MHZ		
..1	400-965	IC, VCO 935-965 MHZ	1	U6
..1	800-375AT	Transmitter Synthesizer Board Assy Generic (SBCM)	1	PCB1
....2	011-7.3728	Crystal,SMT,7.3728 MHz, 50ppm, Epson MA-506-7.3728M-C2	1	X1
....2	012-280-1	TCXO, SMT, 12.800 MHZ, 1PPM	1	U15
....2	108-502	Potentiometer, 5K ohms, SMT, Bourns 3224W-1-502E (note)	1	R74
....2	185-000	Resistor,0 Ohm 1206 Chip Mfg# DALCRCW1206000ZT-X	5	R24, R25, R38, R83, R84
....2	185-1.62K	Resistor, SMT, 1206, 1.62K Ohm, Dale CRCW1206-1.62K	1	R53
....2	185-1.82K	RESISTER, SMT, 1206, 1.82K, 1%	2	R50, R51
....2	185-100	Resistor, 10 Ohm Dale CRCW1206-10 1% Tape & Reel	3	R18, R35, R36
....2	185-101	RESISTOR, 1/8 W 100 OHM CHIP 5%	2	R59, R78
....2	185-102	Resistor, 1K ohm 1/8 watt 1% chip Dale CRCW1206-1K	16	R3, R6, R7, R15, R17, R19, R33, R45, R67, R69, R70, R71, R72, R75, R81, R86
....2	185-103	Resistor, 10K ohm 1/8 watt 1% chip Dale CRCW1206-10K	7	R8, R13, R20, R52, R66, R68, R77
....2	185-104	Resistor, Dale CRCW1206-100K 100k ohm 1/8 watt 1% chip	1	R16
....2	185-133	Resistor,SMT,1206,133 ohms,1%	1	R37
....2	185-150	Resistor, 15 ohm 1/8 watt 5% chip Dale #CRCW1206150JT	1	R27
....2	185-18.2	RES,18.2 OHM,1%,0.25W,1206	3	R21, R22, R23
....2	185-2.21K	RES,2.21K OHM,1%,0.25W,1206	1	R73
....2	185-2.74K	Resistor, SMT, size 1206, 2.74K ohms, Dale CRCW1206-2.74K	3	R1, R30, R60
....2	185-22.1	Resistor, SMT, size 1206, 22.1 ohms, Dale CRCW1206-22.1	1	R5
....2	185-22.1K	Resistor, SMT, 1206, 22.1K, Dale CRCW1206-22.1K	1	R76
....2	185-3.32K	Resistor, SMT, 1206, 3.32K, Dale CRCW1206-3.32K	1	R44
....2	185-39.2	Resistor, SMT, size 1206, 39.2 ohms, Dale CRCW1206-39.2	2	R28, R29
....2	185-4.75K	Resistor, SMT, 1206, 4.75K, Dale CRCW1206-4.75K	9	R4, R11, R54, R56, R58, R79, R80, R82, R87
....2	185-432	Resistor, SMT, size 1206, 432 ohms, Dale CRCW1206-432	1	R14
....2	185-47.5	Resistor, SMT, size 1206, 47.5 ohms, Dale CRCW1206-47.5	1	R34
....2	185-47.5K	Resistor, SMT, size 1206, 47.5K ohms, Dale CRCW1206-47.5K	4	R46, R47, R48, R49



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	185-475	Resistor, SMT, Size 1206, 475 ohms, Dale CRCW1206-475	3	R55, R57, R62,
....2	185-5.11K	Resistor, SMT, size 1206, 5.11K ohms, Dale CRCW1206-5.11K	4	R2, R31, R32, R61
....2	185-51.1	Resistor, SMT, 1206, 51.1 ohm, Dale CRCW1206-51.1	1	R43
.....3	198-2024	TRMR, 2K OHMS, TOP ADJUST,10 TURN,SMD	1	R63
....2	270-100	Capacitor, monolithic chip, 10 pf 50v Kemet C1206C100J5GACTR	1	C26
....2	270-102	Cap,monolithic,1000pf 50v 5%KemetC1206C102J5GACTR marked	14	C6, C9, C16, C18, C27, C28, C29, C31, C44, C45, C50, C51, C52, C61
....2	270-103	Cap, Monolithic chip 10000pF 10% XR7 Kemet C1206C103J5RACR	7	C19, C25, C30, C33, C39, C43, C55
....2	270-104	Capacitor, Monolithic Chip 100000pF 1% C1206C104J5RAC Kemet	4	C20, C35, C14, C15
....2	270-330	Capacitor,monolithic chip,33 pf 50v 5% Kemet C1206C330J5GAC	2	C57, C58
....2	270-407-1	Capacitor,SMT,size 1206,4.7pF,COG,100V Kemet C1206C479C1GAC	1	R26
....2	298-105	Cap SMT 1mF 16V Tantalum Kemet T491A105M016AS	11	C5, C8, C21, C24, C32, C34, C38, C42, C54, C56, C62
....2	298-106	Cap., Tantalum, SMT, Size B, 10uF, 16V,Kemet T491B106K016AS	1	C41
....2	298-107	Cap.,Tantalum,SMT, Size D, 100uF, 16V,Kemet T491X107K016AS	9	C1, C3, C17, C22, C23, C40, C53, C59, C60
....2	298-156	Capacitor,Tantalum,SMT,size D, 15uF,25V Kemet T491D156K025AS	2	C10, C12
....2	298-157	Capacitor,Tantalum,SMT,size X,150uF,16V Kemet T491X157K016AS	2	C11, C13
....2	298-476	Capacitor,Tantalum,SMT,size D, 47uF,16V Kemet T491D476K016AS	2	C4, C36, C7
....2	330-024	Inductor, 10uH SMT DN12103JTR-ND DELEVAN 5%	7	L1, L2, L3, L6, L7, L8, L9
....2	350-191	Inductor, SMT, 1008, 330nH, Coilcraft 1008CS-331XKBC	2	L4, L5
....2	400-158	IC, SMT, PLL Freq Synth, Serial inp Motorola MC145158DW2	1	U5
....2	400-495	IC, SMT, OP-AMP, QUAD, RAIL TO RAIL	1	U2
....2	400-678	IC, SMT, MMIC AMPLIFIER, 2 GHz, BROADBAND	2	U10, U11
....2	401-275	IC,SMT,OP-AMP,LOW NOISE,HIGH AUDIO BW	2	U7, U8
....2	401-317	IC, SMT, Regulator,Adjustable, 1.5 Amps,National LM317AEMP	1	U14
....2	402-054	IC,SMT,Prescaler, Dual Mod, 64/65-128/129 Motorola MC12054AD	1	U4
....2	407-376	IC,SMT,Digital Pot,15V,10K Ohms Analog Device AD7376AR10	1	U9

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	408-402	ICSMT, Digital Pot,2 Ch,100K ohms,Analog Device AD8402AR100	1	U16
....2	409-044	IC, SMT, Microcontroller Atmel AT90S4433-8AI (note)	1	U1
....2	415-840	Diode, Zener, SMT, 13V, Vishay BZX84C13TR	1	D1
....2	418-447	Diode, SMT, Zener, 4.7V, Motorola BZX84C4V7LT1	1	D3
....2	418-451	Diode, SMT, Zener, 5.1V Motorola BZX84C5V1LT1	2	D2, D4
....2	420-141	Transistor, SMT, Darlington, NPN, Mototrola MMBTA14LT1	5	Q1, Q2, Q3, Q4, Q5
....2	439-041	TRANSISTOR, SMT, GENERAL PURPOSE, NPN	3	Q7, Q8, Q9
....2	550-193	CONNECTOR, S.FL2-R-SMT SURFACE MOUNT	1	J1
....2	550-325-16	Conn,16-Pin (cut from 550-325) Right Angle	1	P1
.....3	550-325	CONN, RIGHT ANGLE DUAL ROW 80-PIN	0.2	
....2	550-325-20	Conn,20-Pin (cut from 550-325) Right Angle	1	P2
.....3	550-325	CONN, RIGHT ANGLE DUAL ROW 80-PIN	0.25	
....2	700-0119	TAPE,KAPTON 1/4	0.001	
....2	700-226-63	Exterior Fencing&Cover,Synth Leader Tech88-CBSU-2.25x5.75x.8	1	
....2	800-375B	PC Board, Transmitter Synthesizer,	1	
..1	800-375ATSW2	RPU/STL XMIT SYN SW VERSION 2	1	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	953-2140-153	PA ASSY, 150MHZ, 30W, SRPT/STL, 2ND GEN (*NOTE*)	1	
....2	101-6652	RES,CHIP,66.5K,1/8W,1%,SMD	1	R11
....2	185-22.1K	Resistor, SMT, 1206, 22.1K, Dale CRCW1206-22.1K	-1	
....2	270-180-1	CAP, SMT, 18 PF, 100V Kemet C1206C180J1GAC	3	C35, C36, C37
....2	350-200	INDUCTOR, SMT, 1812, 56NH	2	L8, L11
....2	350-201	INDUCTOR, SMT, 1812, 82NH	2	L9, L10
....2	401-338	IC, SMT, REGULATOR, 5 AMP, LM338T *NOTE*	3	U5, U6, U7
....2	407-0036	INSULATOR,MICA,TO-220,56-77-11	3	INS1, INS2, INS3
....2	422-6107	SCREW,SEMS 6-32 X 7/16 PAN PH.ST."	2	
....2	423-4001	#4 FLAT SS .250 X .125 X .018	3	
....2	423-6003	#6 LOCK INT TOOTH	5	
....2	441-0184	STOFF,6-32,MALE-FEMALE,3/8	5	
....2	468-0760-001	PA MODULE, 30W, 12.5V, 135-175 MHZ	1	U3
....2	500-211	Screw,SEMS 4-40x3/8 Ph Pan Head MS Black Zinc (External)	3	
....2	520-050D5	Heatsink, Drilled For SRPT-30/40A (SBCM)	1	
.....3	520-050	HEATSINK, THERMALLOY 10871 UX3.000 DEBURRED, PLAIN FINISH	1	
....2	594-0503	LABEL, DANGER-HAZARDOUS VOLTAGE	1	
....2	913-2140	RF PA BD ASSY 2ND GEN PA MODULES SRPT/STL(SBCM)	1	A1
.....3	108-502	Potentiometer, 5K ohms, SMT, Bourns 3224W-1-502E	3	R5, R17, R20
.....3	184-001	Resistor, SMT, 3 Watt, 0.1 ohm 1%, Dale WSR-3-.1-1%	3	R8, R9, R10
.....3	184-005	Resistor,SMT, 3Watt. 0.05 ohms, Dale WSR-3-.05-1%	2	R3, R18
.....3	185-000	Resistor,0 Ohm 1206 Chip Mfg# DALCRCW1206000ZT-X	1	R37
.....3	185-1.21K	Resistor, SMT, size 1206, 1.21K ohms, Dale CRCW1206-1.21K	2	R19, R28
.....3	185-101	RESISTOR, 1/8 W 100 OHM CHIP 5%	1	R7
.....3	185-102	Resistor, 1K ohm 1/8 watt 1% chip Dale CRCW1206-1K	3	R12, R14, R33
.....3	185-103	Resistor, 10K ohm 1/8 watt 1% chip Dale CRCW1206-10K	3	R21, R24, R32
.....3	185-2.21K	RES,2.21K OHM,1%,0.25W,1206	1	R34
.....3	185-22.1K	Resistor, SMT, 1206, 22.1K, Dale CRCW1206-22.1K	2	R11, R29
.....3	185-274	Resistor, SMT, 1206, 274 ohm, Dale CRCW1206-274	2	R2, R15
.....3	185-3.32K	Resistor, SMT, 1206, 3.32K, Dale CRCW1206-3.32K	1	R31
.....3	185-330-1	RESISTOR, SMT, 1206, 33.2 OHM, 1%	1	R23
.....3	185-392	Resistor, SMT, size 1206, 392 ohms, Dale CRCW1206-392	1	R6

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	185-4.75K	Resistor, SMT, 1206, 4.75K, Dale CRCW1206-4.75K	2	R4, R25
.....3	185-47.5K	Resistor, SMT, size 1206, 47.5K ohms, Dale CRCW1206-47.5K	1	R13
.....3	185-475	Resistor, SMT, Size 1206, 475 ohms, Dale CRCW1206-475	1	R27
.....3	185-51.1	Resistor, SMT, 1206, 51.1 ohm, Dale CRCW1206-51.1	1	R22
.....3	210-1047	DIODE,ZENER,4.7V,225MW,SMD,SOT23	1	D6
.....3	216-0056	TRANS, PNP, MMBTA56, SOT-23	1	Q1
.....3	270-102	Cap,monolithic,1000pf 50v 5%KemetC1206C102J5GACTR marked	10	C19, C23, C25, C26, C27, C28, C30, C32, C33, C34
.....3	270-104	Capacitor, Monolithic Chip 100000pF 1% C1206C104J5RAC Kemet	1	C24
.....3	270-472	CAP, SMT, 1206, 4700 PF, COG, 50V (NOTE)	2	C7, C39
.....3	298-105	Cap SMT 1mF 16V Tantalum Kemet T491A105M016AS	5	C17, C18, C21, C22, C40
.....3	298-106	Cap., Tantalum, SMT, Size B, 10uF, 16V,Kemet T491B106K016AS	1	C8
.....3	298-107	Cap.,Tantalum,SMT, Size D, 100uF, 16V,Kemet T491X107K016AS	1	C31
.....3	298-336	Cap.,Tantalum,SMT,Size C, 33uF,16V,Sprague T491C336K016AS	2	C20, C29
.....3	350-191	Inductor, SMT, 1008, 330nH, Coilcraft 1008CS-331XKBC	1	L7
.....3	350-196	Inductor, SMT, Power, 0.68, Coilcraft DO3316P-681HC	1	L1
.....3	400-295	IC,OP-AMP, GENERAL PURPOSE, OP295GS	1	U8
.....3	400-495	IC, SMT, OP-AMP, QUAD, RAIL TO RAIL	1	U1
.....3	410-305	Diode, Motorola MMBD101L chip	2	D3, D4
.....3	415-222	Diode, Zener, SMT, 2.5V, Motorola MMSZ5222BT1	1	D5
.....3	418-447	Diode, SMT, Zener, 4.7V, Motorola BZX84C4V7LT1	1	D7
.....3	420-907	TRANSISTOR, GENERAL PURPOSE PNP, SMT, MMBT2907ALT1	1	Q2
.....3	439-041	TRANSISTOR, SMT, GENERAL PURPOSE, NPN	1	Q3
.....3	513-2140	PCB MACH 2ND GEN PA BD ASSY SRPT/STL	1	
.....3	550-138	Connector, 8 pin Molex header (cut from 550-162)	1	P1
.....4	550-162	Connector, 24 pin break-away (straight) Molex 26-48-6248	0.333	
.....3	550-193	CONNECTOR, S.FL2-R-SMT SURFACE MOUNT	1	P2
.....3	550-324	Connector,6-Pin Header	1	P3
.....4	550-214	Connector, breakaway header Molex 22-28-4361	0.167	
.....3	700-0119	TAPE,KAPTON 1/4	0.001	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	700-226-59	RF Shielding Fence For Power Amplifier(Interior)	1	
.....3	700-268	Leader Tech Fence # 47-CBSU-2.75 X 5.75 X .4 NO COVER	1	
....2	949-0365	CABLE, RF OUTPUT, SRPT-40A (SBCM)	1	
.....3	550-037	CONNECTOR, UG-58A/U N PANEL RECEPTICLE	1	
.....3	550-057	Connector, UG-177/U UHF hood Amphenol 83-765	1	
.....3	621-1359	CBL,COAX,RG316/U,50 OHM	0.33	
....2	959-0321	ASSY., THERMOCOUPLE	1	
.....3	120-002	THERMISTOR, 1000 OHM @ 25C 10%	1	
.....3	512-002	Terminal, vinyl insulated C10 #10 stud #10-12 wire	1	
....2	DB61024	Washer, TO-220 Shoulder NYL Thermalloy #7721-7PPS	3	

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	953-2140-233	PA ASSY, 230MHZ, 30W, SRPT/STL, 2ND GEN (*NOTE*)	1	
....2	101-6652	RES,CHIP,66.5K,1/8W,1%,SMD	1	R11
....2	185-22.1K	Resistor, SMT, 1206, 22.1K, Dale CRCW1206-22.1K	-1	
....2	270-120	CAP, SMT, 12PF, 100V	3	C35, C36, C37
....2	350-200	INDUCTOR, SMT, 1812, 56NH	2	L9, L10
....2	350-202	IND, SMT, 1812, 39 NH	2	L8, L11
....2	401-338	IC, SMT, REGULATOR, 5 AMP, LM338T *NOTE*	3	U5, U6, U7
....2	407-0036	INSULATOR,MICA,TO-220,56-77-11	3	INS1, INS2, INS3
....2	422-6107	SCREW,SEMS 6-32 X 7/16 PAN PH.ST."	2	
....2	423-4001	#4 FLAT SS .250 X .125 X .018	3	
....2	423-6003	#6 LOCK INT TOOTH	5	
....2	441-0184	STOFF,6-32,MALE-FEMALE,3/8	5	
....2	468-0760-003	PA MODULE, 30W, 12.5V, 210-270 MHZ	1	U3
....2	500-211	Screw,SEMS 4-40x3/8 Ph Pan Head MS Black Zinc (External)	3	
....2	520-050D5	Heatsink, Drilled For SRPT-30/40A (SBCM)	1	
.....3	520-050	HEATSINK, THERMALLOY 10871 UX3.000 DEBURRED, PLAIN FINISH	1	
....2	594-0503	LABEL, DANGER-HAZARDOUS VOLTAGE	1	
....2	913-2140	RF PA BD ASSY 2ND GEN PA MODULES SRPT/STL(SBCM)	1	A1
.....3	108-502	Potentiometer, 5K ohms, SMT, Bourns 3224W-1-502E	3	R5, R17, R20
.....3	184-001	Resistor, SMT, 3 Watt, 0.1 ohm 1%, Dale WSR-3-.1-1%	3	R8, R9, R10
.....3	184-005	Resistor,SMT, 3Watt. 0.05 ohms, Dale WSR-3-.05-1%	2	R3, R18
.....3	185-000	Resistor,0 Ohm 1206 Chip Mfg# DALCRCW1206000ZT-X	1	R37
.....3	185-1.21K	Resistor, SMT, size 1206, 1.21K ohms, Dale CRCW1206-1.21K	2	R19, R28
.....3	185-101	RESISTOR, 1/8 W 100 OHM CHIP 5%	1	R7
.....3	185-102	Resistor, 1K ohm 1/8 watt 1% chip Dale CRCW1206-1K	3	R12, R14, R33
.....3	185-103	Resistor, 10K ohm 1/8 watt 1% chip Dale CRCW1206-10K	3	R21, R24, R32
.....3	185-2.21K	RES,2.21K OHM,1%,0.25W,1206	1	R34
.....3	185-22.1K	Resistor, SMT, 1206, 22.1K, Dale CRCW1206-22.1K	2	R11, R29
.....3	185-274	Resistor, SMT, 1206, 274 ohm, Dale CRCW1206-274	2	R2, R15
.....3	185-3.32K	Resistor, SMT, 1206, 3.32K, Dale CRCW1206-3.32K	1	R31
.....3	185-330-1	RESISTOR, SMT, 1206, 33.2 OHM, 1%	1	R23
.....3	185-392	Resistor, SMT, size 1206, 392 ohms, Dale CRCW1206-392	1	R6
.....3	185-4.75K	Resistor, SMT, 1206, 4.75K, Dale CRCW1206-4.75K	2	R4, R25



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	185-47.5K	Resistor, SMT, size 1206, 47.5K ohms, Dale CRCW1206-47.5K	1	R13
.....3	185-475	Resistor, SMT, Size 1206, 475 ohms, Dale CRCW1206-475	1	R27
.....3	185-51.1	Resistor, SMT, 1206, 51.1 ohm, Dale CRCW1206-51.1	1	R22
.....3	210-1047	DIODE,ZENER,4.7V,225MW,SMD,SOT23	1	D6
.....3	216-0056	TRANS, PNP, MMBTA56, SOT-23	1	Q1
.....3	270-102	Cap,monolithic,1000pf 50v 5%KemetC1206C102J5GACTR marked	10	C19, C23, C25, C26, C27, C28, C30, C32, C33, C34
.....3	270-104	Capacitor, Monolithic Chip 100000pF 1% C1206C104J5RAC Kemet	1	C24
.....3	270-472	CAP, SMT, 1206, 4700 PF, COG, 50V (NOTE)	2	C7, C39
.....3	298-105	Cap SMT 1mF 16V Tantalum Kemet T491A105M016AS	5	C17, C18, C21, C22, C40
.....3	298-106	Cap., Tantalum, SMT, Size B, 10uF, 16V,Kemet T491B106K016AS	1	C8
.....3	298-107	Cap.,Tantalum,SMT, Size D, 100uF, 16V,Kemet T491X107K016AS	1	C31
.....3	298-336	Cap.,Tantalum,SMT,Size C, 33uF,16V,Sprague T491C336K016AS	2	C20, C29
.....3	350-191	Inductor, SMT, 1008, 330nH, Coilcraft 1008CS- 331XKBC	1	L7
.....3	350-196	Inductor, SMT, Power, 0.68, Coilcraft DO3316P-681HC	1	L1
.....3	400-295	IC,OP-AMP, GENERAL PURPOSE, OP295GS	1	U8
.....3	400-495	IC, SMT, OP-AMP, QUAD, RAIL TO RAIL	1	U1
.....3	410-305	Diode, Motorola MMBD101L chip	2	D3, D4
.....3	415-222	Diode, Zener, SMT, 2.5V, Motorola MMSZ5222BT1	1	D5
.....3	418-447	Diode, SMT, Zener, 4.7V, Motorola BZX84C4V7LT1	1	D7
.....3	420-907	TRANSISTOR, GENERAL PURPOSE PNP, SMT, MMBT2907ALT1	1	Q2
.....3	439-041	TRANSISTOR, SMT, GENERAL PURPOSE, NPN	1	Q3
.....3	513-2140	PCB MACH 2ND GEN PA BD ASSY SRPT/STL	1	
.....3	550-138	Connector, 8 pin Molex header (cut from 550- 162)	1	P1
.....4	550-162	Connector, 24 pin break-away (straight) Molex 26-48-6248	0.333	
.....3	550-193	CONNECTOR, S.FL2-R-SMT SURFACE MOUNT	1	P2
.....3	550-324	Connector,6-Pin Header	1	P3
.....4	550-214	Connector, breakaway header Molex 22-28- 4361	0.167	
.....3	700-0119	TAPE,KAPTON 1/4	0.001	
.....3	700-226-59	RF Shielding Fence For Power Amplifier(Interior)	1	

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	700-268	Leader Tech Fence # 47-CBSU-2.75 X 5.75 X .4 NO COVER	1	
....2	949-0365	CABLE, RF OUTPUT, SRPT-40A (SBCM)	1	
.....3	550-037	CONNECTOR, UG-58A/U N PANEL RECEPTICLE	1	
.....3	550-057	Connector, UG-177/U UHF hood Amphenol 83-765	1	
.....3	621-1359	CBL,COAX,RG316/U,50 OHM	0.33	
....2	959-0321	ASSY., THERMOCOUPLE	1	
.....3	120-002	THERMISTOR, 1000 OHM @ 25C 10%	1	
.....3	512-002	Terminal, vinyl insulated C10 #10 stud #10-12 wire	1	
....2	DB61024	Washer, TO-220 Shoulder NYL Thermalloy #7721-7PPS	3	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	953-2140-253	PA ASSY, 250MHZ, 30W, SRPT/STL, 2ND GEN (*NOTE*)	1	
....2	270-100-1	CAP, SMT, 10 PF, 100V	3	C35, C36, C37
....2	350-203	IND, SMT, 1812, 33 NH	2	L8, L11
....2	350-204	IND, SMT, 1812, 47 NH	2	L9, L10
....2	401-338	IC, SMT, REGULATOR, 5 AMP, LM338T *NOTE*	3	U5, U6, U7
....2	407-0036	INSULATOR,MICA,TO-220,56-77-11	3	INS1, INS2, INS3
....2	422-6107	SCREW,SEMS 6-32 X 7/16 PAN PH.ST."	2	
....2	423-4001	#4 FLAT SS .250 X .125 X .018	3	
....2	423-6003	#6 LOCK INT TOOTH	5	
....2	441-0184	STOFF,6-32,MALE-FEMALE,3/8	5	
....2	468-0760-003	PA MODULE, 30W, 12.5V, 210-270 MHZ	1	U3
....2	500-211	Screw,SEMS 4-40x3/8 Ph Pan Head MS Black Zinc (External)	3	
....2	520-050D5	Heatsink, Drilled For SRPT-30/40A (SBCM)	1	
.....3	520-050	HEATSINK, THERMALLOY 10871 UX3.000 DEBURRED, PLAIN FINISH	1	
....2	594-0503	LABEL, DANGER-HAZARDOUS VOLTAGE	1	
....2	913-2140	RF PA BD ASSY 2ND GEN PA MODULES SRPT/STL(SBCM)	1	A1
.....3	108-502	Potentiometer, 5K ohms, SMT, Bourns 3224W-1-502E	3	R5, R17, R20
.....3	184-001	Resistor, SMT, 3 Watt, 0.1 ohm 1%, Dale WSR-3-.1-1%	3	R8, R9, R10
.....3	184-005	Resistor,SMT, 3Watt. 0.05 ohms, Dale WSR-3-.05-1%	2	R3, R18
.....3	185-000	Resistor,0 Ohm 1206 Chip Mfg# DALCRCW1206000ZT-X	1	R37
.....3	185-1.21K	Resistor, SMT, size 1206, 1.21K ohms, Dale CRCW1206-1.21K	2	R19, R28
.....3	185-101	RESISTOR, 1/8 W 100 OHM CHIP 5%	1	R7
.....3	185-102	Resistor, 1K ohm 1/8 watt 1% chip Dale CRCW1206-1K	3	R12, R14, R33
.....3	185-103	Resistor, 10K ohm 1/8 watt 1% chip Dale CRCW1206-10K	3	R21, R24, R32
.....3	185-2.21K	RES,2.21K OHM,1%,0.25W,1206	1	R34
.....3	185-22.1K	Resistor, SMT, 1206, 22.1K, Dale CRCW1206-22.1K	2	R11, R29
.....3	185-274	Resistor, SMT, 1206, 274 ohm, Dale CRCW1206-274	2	R2, R15
.....3	185-3.32K	Resistor, SMT, 1206, 3.32K, Dale CRCW1206-3.32K	1	R31
.....3	185-330-1	RESISTOR, SMT, 1206, 33.2 OHM, 1%	1	R23
.....3	185-392	Resistor, SMT, size 1206, 392 ohms, Dale CRCW1206-392	1	R6
.....3	185-4.75K	Resistor, SMT, 1206, 4.75K, Dale CRCW1206-4.75K	2	R4, R25
.....3	185-47.5K	Resistor, SMT, size 1206, 47.5K ohms, Dale CRCW1206-47.5K	1	R13

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	185-475	Resistor, SMT, Size 1206, 475 ohms, Dale CRCW1206-475	1	R27
.....3	185-51.1	Resistor, SMT, 1206, 51.1 ohm, Dale CRCW1206-51.1	1	R22
.....3	210-1047	DIODE,ZENER,4.7V,225MW,SMD,SOT23	1	D6
.....3	216-0056	TRANS, PNP, MMBTA56, SOT-23	1	Q1
.....3	270-102	Cap,monolithic,1000pf 50v 5%KemetC1206C102J5GACTR marked	10	C19, C23, C25, C26, C27, C28, C30, C32, C33, C34
.....3	270-104	Capacitor, Monolithic Chip 100000pF 1% C1206C104J5RAC Kemet	1	C24
.....3	270-472	CAP, SMT, 1206, 4700 PF, COG, 50V (NOTE)	2	C7, C39
.....3	298-105	Cap SMT 1mF 16V Tantalum Kemet T491A105M016AS	5	C17, C18, C21, C22, C40
.....3	298-106	Cap., Tantalum, SMT, Size B, 10uF, 16V,Kemet T491B106K016AS	1	C8
.....3	298-107	Cap.,Tantalum,SMT, Size D, 100uF, 16V,Kemet T491X107K016AS	1	C31
.....3	298-336	Cap.,Tantalum,SMT,Size C, 33uF,16V,Sprague T491C336K016AS	2	C20, C29
.....3	350-191	Inductor, SMT, 1008, 330nH, Coilcraft 1008CS- 331XKBC	1	L7
.....3	350-196	Inductor, SMT, Power, 0.68, Coilcraft DO3316P-681HC	1	L1
.....3	400-295	IC,OP-AMP, GENERAL PURPOSE, OP295GS	1	U8
.....3	400-495	IC, SMT, OP-AMP, QUAD, RAIL TO RAIL	1	U1
.....3	410-305	Diode, Motorola MMBD101L chip	2	D3, D4
.....3	415-222	Diode, Zener, SMT, 2.5V, Motorola MMSZ5222BT1	1	D5
.....3	418-447	Diode, SMT, Zener, 4.7V, Motorola BZX84C4V7LT1	1	D7
.....3	420-907	TRANSISTOR, GENERAL PURPOSE PNP, SMT, MMBT2907ALT1	1	Q2
.....3	439-041	TRANSISTOR, SMT, GENERAL PURPOSE, NPN	1	Q3
.....3	513-2140	PCB MACH 2ND GEN PA BD ASSY SRPT/STL	1	
.....3	550-138	Connector, 8 pin Molex header (cut from 550- 162)	1	P1
.....4	550-162	Connector, 24 pin break-away (straight) Molex 26-48-6248	0.333	
.....3	550-193	CONNECTOR, S.FL2-R-SMT SURFACE MOUNT	1	P2
.....3	550-324	Connector,6-Pin Header	1	P3
.....4	550-214	Connector, breakaway header Molex 22-28- 4361	0.167	
.....3	700-0119	TAPE,KAPTON 1/4	0.001	
.....3	700-226-59	RF Shielding Fence For Power Amplifier(Interior)	1	
.....3	700-268	Leader Tech Fence # 47-CBSU-2.75 X 5.75 X .4 NO COVER	1	
....2	949-0365	CABLE, RF OUTPUT, SRPT-40A (SBCM)	1	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	550-037	CONNECTOR, UG-58A/U N PANEL RECEPTICLE	1	
.....3	550-057	Connector, UG-177/U UHF hood Amphenol 83-765	1	
.....3	621-1359	CBL,COAX,RG316/U,50 OHM	0.33	
....2	959-0321	ASSY., THERMOCOUPLE	1	
.....3	120-002	THERMISTOR, 1000 OHM @ 25C 10%	1	
.....3	512-002	Terminal, vinyl insulated C10 #10 stud #10-12 wire	1	
....2	DB61024	Washer, TO-220 Shoulder NYL Thermalloy #7721-7PPS	3	

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	953-2140-333	PA ASSY, 330MHZ, 30W, SRPT/STL, 2ND GEN (*NOTE*)	1	
....2	270-608-1	CAP, SMT, 6.8 PF, 100V	3	C35, C36, C37
....2	350-203	IND, SMT, 1812, 33 NH	2	L9, L10
....2	350-205	IND, SMT, 1812, 22 NH	2	L8, L11
....2	401-338	IC, SMT, REGULATOR, 5 AMP, LM338T *NOTE*	3	U5, U6, U7
....2	407-0036	INSULATOR,MICA,TO-220,56-77-11	3	INS1, INS2, INS3
....2	422-6107	SCREW,SEMS 6-32 X 7/16 PAN PH.ST."	2	
....2	423-4001	#4 FLAT SS .250 X .125 X .018	3	
....2	423-6003	#6 LOCK INT TOOTH	5	
....2	441-0184	STOFF,6-32,MALE-FEMALE,3/8	5	
....2	468-0760-004	PA MODULE, 30W, 12.5V, 330-400 MHZ	1	U3
....2	500-211	Screw,SEMS 4-40x3/8 Ph Pan Head MS Black Zinc (External)	3	
....2	520-050D5	Heatsink, Drilled For SRPT-30/40A (SBCM)	1	
.....3	520-050	HEATSINK, THERMALLOY 10871 UX3.000 DEBURRED, PLAIN FINISH	1	
....2	594-0503	LABEL, DANGER-HAZARDOUS VOLTAGE	1	
....2	913-2140	RF PA BD ASSY 2ND GEN PA MODULES SRPT/STL(SBCM)	1	A1
.....3	108-502	Potentiometer, 5K ohms, SMT, Bourns 3224W-1-502E	3	R5, R17, R20
.....3	184-001	Resistor, SMT, 3 Watt, 0.1 ohm 1%, Dale WSR-3-.1-1%	3	R8, R9, R10
.....3	184-005	Resistor,SMT, 3Watt. 0.05 ohms, Dale WSR-3-.05-1%	2	R3, R18
.....3	185-000	Resistor,0 Ohm 1206 Chip Mfg# DALCRCW1206000ZT-X	1	R37
.....3	185-1.21K	Resistor, SMT, size 1206, 1.21K ohms, Dale CRCW1206-1.21K	2	R19, R28
.....3	185-101	RESISTOR, 1/8 W 100 OHM CHIP 5%	1	R7
.....3	185-102	Resistor, 1K ohm 1/8 watt 1% chip Dale CRCW1206-1K	3	R12, R14, R33
.....3	185-103	Resistor, 10K ohm 1/8 watt 1% chip Dale CRCW1206-10K	3	R21, R24, R32
.....3	185-2.21K	RES,2.21K OHM,1%,0.25W,1206	1	R34
.....3	185-22.1K	Resistor, SMT, 1206, 22.1K, Dale CRCW1206-22.1K	2	R11, R29
.....3	185-274	Resistor, SMT, 1206, 274 ohm, Dale CRCW1206-274	2	R2, R15
.....3	185-3.32K	Resistor, SMT, 1206, 3.32K, Dale CRCW1206-3.32K	1	R31
.....3	185-330-1	RESISTOR, SMT, 1206, 33.2 OHM, 1%	1	R23
.....3	185-392	Resistor, SMT, size 1206, 392 ohms, Dale CRCW1206-392	1	R6
.....3	185-4.75K	Resistor, SMT, 1206, 4.75K, Dale CRCW1206-4.75K	2	R4, R25
.....3	185-47.5K	Resistor, SMT, size 1206, 47.5K ohms, Dale CRCW1206-47.5K	1	R13



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	185-475	Resistor, SMT, Size 1206, 475 ohms, Dale CRCW1206-475	1	R27
.....3	185-51.1	Resistor, SMT, 1206, 51.1 ohm, Dale CRCW1206-51.1	1	R22
.....3	210-1047	DIODE,ZENER,4.7V,225MW,SMD,SOT23	1	D6
.....3	216-0056	TRANS, PNP, MMBTA56, SOT-23	1	Q1
.....3	270-102	Cap,monolithic,1000pf 50v 5%KemetC1206C102J5GACTR marked	10	C19, C23, C25, C26, C27, C28, C30, C32, C33, C34
.....3	270-104	Capacitor, Monolithic Chip 100000pF 1% C1206C104J5RAC Kemet	1	C24
.....3	270-472	CAP, SMT, 1206, 4700 PF, COG, 50V (NOTE)	2	C7, C39
.....3	298-105	Cap SMT 1mF 16V Tantalum Kemet T491A105M016AS	5	C17, C18, C21, C22, C40
.....3	298-106	Cap., Tantalum, SMT, Size B, 10uF, 16V,Kemet T491B106K016AS	1	C8
.....3	298-107	Cap.,Tantalum,SMT, Size D, 100uF, 16V,Kemet T491X107K016AS	1	C31
.....3	298-336	Cap.,Tantalum,SMT,Size C, 33uF,16V,Sprague T491C336K016AS	2	C20, C29
.....3	350-191	Inductor, SMT, 1008, 330nH, Coilcraft 1008CS- 331XKBC	1	L7
.....3	350-196	Inductor, SMT, Power, 0.68, Coilcraft DO3316P-681HC	1	L1
.....3	400-295	IC,OP-AMP, GENERAL PURPOSE, OP295GS	1	U8
.....3	400-495	IC, SMT, OP-AMP, QUAD, RAIL TO RAIL	1	U1
.....3	410-305	Diode, Motorola MMBD101L chip	2	D3, D4
.....3	415-222	Diode, Zener, SMT, 2.5V, Motorola MMSZ5222BT1	1	D5
.....3	418-447	Diode, SMT, Zener, 4.7V, Motorola BZX84C4V7LT1	1	D7
.....3	420-907	TRANSISTOR, GENERAL PURPOSE PNP, SMT, MMBT2907ALT1	1	Q2
.....3	439-041	TRANSISTOR, SMT, GENERAL PURPOSE, NPN	1	Q3
.....3	513-2140	PCB MACH 2ND GEN PA BD ASSY SRPT/STL	1	
.....3	550-138	Connector, 8 pin Molex header (cut from 550- 162)	1	P1
.....4	550-162	Connector, 24 pin break-away (straight) Molex 26-48-6248	0.333	
.....3	550-193	CONNECTOR, S.FL2-R-SMT SURFACE MOUNT	1	P2
.....3	550-324	Connector,6-Pin Header	1	P3
.....4	550-214	Connector, breakaway header Molex 22-28- 4361	0.167	
.....3	700-0119	TAPE,KAPTON 1/4	0.001	
.....3	700-226-59	RF Shielding Fence For Power Amplifier(Interior)	1	
.....3	700-268	Leader Tech Fence # 47-CBSU-2.75 X 5.75 X .4 NO COVER	1	
....2	949-0365	CABLE, RF OUTPUT, SRPT-40A (SBCM)	1	

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	550-037	CONNECTOR, UG-58A/U N PANEL RECEPTICLE	1	
.....3	550-057	Connector, UG-177/U UHF hood Amphenol 83-765	1	
.....3	621-1359	CBL,COAX,RG316/U,50 OHM	0.33	
....2	959-0321	ASSY., THERMOCOUPLE	1	
.....3	120-002	THERMISTOR, 1000 OHM @ 25C 10%	1	
.....3	512-002	Terminal, vinyl insulated C10 #10 stud #10-12 wire	1	
....2	DB61024	Washer, TO-220 Shoulder NYL Thermalloy #7721-7PPS	3	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	953-2140-333	PA ASSY, 330MHZ, 30W, SRPT/STL, 2ND GEN (*NOTE*)	1	
....2	270-608-1	CAP, SMT, 6.8 PF, 100V	3	C35, C36, C37
....2	350-203	IND, SMT, 1812, 33 NH	2	L9, L10
....2	350-205	IND, SMT, 1812, 22 NH	2	L8, L11
....2	401-338	IC, SMT, REGULATOR, 5 AMP, LM338T *NOTE*	3	U5, U6, U7
....2	407-0036	INSULATOR,MICA,TO-220,56-77-11	3	INS1, INS2, INS3
....2	422-6107	SCREW,SEMS 6-32 X 7/16 PAN PH.ST."	2	
....2	423-4001	#4 FLAT SS .250 X .125 X .018	3	
....2	423-6003	#6 LOCK INT TOOTH	5	
....2	441-0184	STOFF,6-32,MALE-FEMALE,3/8	5	
....2	468-0760-004	PA MODULE, 30W, 12.5V, 330-400 MHZ	1	U3
....2	500-211	Screw,SEMS 4-40x3/8 Ph Pan Head MS Black Zinc (External)	3	
....2	520-050D5	Heatsink, Drilled For SRPT-30/40A (SBCM)	1	
.....3	520-050	HEATSINK, THERMALLOY 10871 UX3.000 DEBURRED, PLAIN FINISH	1	
....2	594-0503	LABEL, DANGER-HAZARDOUS VOLTAGE	1	
....2	913-2140	RF PA BD ASSY 2ND GEN PA MODULES SRPT/STL(SBCM)	1	A1
.....3	108-502	Potentiometer, 5K ohms, SMT, Bourns 3224W-1-502E	3	R5, R17, R20
.....3	184-001	Resistor, SMT, 3 Watt, 0.1 ohm 1%, Dale WSR-3-.1-1%	3	R8, R9, R10
.....3	184-005	Resistor,SMT, 3Watt. 0.05 ohms, Dale WSR-3-.05-1%	2	R3, R18
.....3	185-000	Resistor,0 Ohm 1206 Chip Mfg# DALCRCW1206000ZT-X	1	R37
.....3	185-1.21K	Resistor, SMT, size 1206, 1.21K ohms, Dale CRCW1206-1.21K	2	R19, R28
.....3	185-101	RESISTOR, 1/8 W 100 OHM CHIP 5%	1	R7
.....3	185-102	Resistor, 1K ohm 1/8 watt 1% chip Dale CRCW1206-1K	3	R12, R14, R33
.....3	185-103	Resistor, 10K ohm 1/8 watt 1% chip Dale CRCW1206-10K	3	R21, R24, R32
.....3	185-2.21K	RES,2.21K OHM,1%,0.25W,1206	1	R34
.....3	185-22.1K	Resistor, SMT, 1206, 22.1K, Dale CRCW1206-22.1K	2	R11, R29
.....3	185-274	Resistor, SMT, 1206, 274 ohm, Dale CRCW1206-274	2	R2, R15
.....3	185-3.32K	Resistor, SMT, 1206, 3.32K, Dale CRCW1206-3.32K	1	R31
.....3	185-330-1	RESISTOR, SMT, 1206, 33.2 OHM, 1%	1	R23
.....3	185-392	Resistor, SMT, size 1206, 392 ohms, Dale CRCW1206-392	1	R6
.....3	185-4.75K	Resistor, SMT, 1206, 4.75K, Dale CRCW1206-4.75K	2	R4, R25
.....3	185-47.5K	Resistor, SMT, size 1206, 47.5K ohms, Dale CRCW1206-47.5K	1	R13

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	185-475	Resistor, SMT, Size 1206, 475 ohms, Dale CRCW1206-475	1	R27
.....3	185-51.1	Resistor, SMT, 1206, 51.1 ohm, Dale CRCW1206-51.1	1	R22
.....3	210-1047	DIODE,ZENER,4.7V,225MW,SMD,SOT23	1	D6
.....3	216-0056	TRANS, PNP, MMBTA56, SOT-23	1	Q1
.....3	270-102	Cap,monolithic,1000pf 50v 5%KemetC1206C102J5GACTR marked	10	C19, C23, C25, C26, C27, C28, C30, C32, C33, C34
.....3	270-104	Capacitor, Monolithic Chip 100000pF 1% C1206C104J5RAC Kemet	1	C24
.....3	270-472	CAP, SMT, 1206, 4700 PF, COG, 50V (NOTE)	2	C7, C39
.....3	298-105	Cap SMT 1mF 16V Tantalum Kemet T491A105M016AS	5	C17, C18, C21, C22, C40
.....3	298-106	Cap., Tantalum, SMT, Size B, 10uF, 16V,Kemet T491B106K016AS	1	C8
.....3	298-107	Cap.,Tantalum,SMT, Size D, 100uF, 16V,Kemet T491X107K016AS	1	C31
.....3	298-336	Cap.,Tantalum,SMT,Size C, 33uF,16V,Sprague T491C336K016AS	2	C20, C29
.....3	350-191	Inductor, SMT, 1008, 330nH, Coilcraft 1008CS- 331XKBC	1	L7
.....3	350-196	Inductor, SMT, Power, 0.68, Coilcraft DO3316P-681HC	1	L1
.....3	400-295	IC,OP-AMP, GENERAL PURPOSE, OP295GS	1	U8
.....3	400-495	IC, SMT, OP-AMP, QUAD, RAIL TO RAIL	1	U1
.....3	410-305	Diode, Motorola MMBD101L chip	2	D3, D4
.....3	415-222	Diode, Zener, SMT, 2.5V, Motorola MMSZ5222BT1	1	D5
.....3	418-447	Diode, SMT, Zener, 4.7V, Motorola BZX84C4V7LT1	1	D7
.....3	420-907	TRANSISTOR, GENERAL PURPOSE PNP, SMT, MMBT2907ALT1	1	Q2
.....3	439-041	TRANSISTOR, SMT, GENERAL PURPOSE, NPN	1	Q3
.....3	513-2140	PCB MACH 2ND GEN PA BD ASSY SRPT/STL	1	
.....3	550-138	Connector, 8 pin Molex header (cut from 550- 162)	1	P1
.....4	550-162	Connector, 24 pin break-away (straight) Molex 26-48-6248	0.333	
.....3	550-193	CONNECTOR, S.FL2-R-SMT SURFACE MOUNT	1	P2
.....3	550-324	Connector,6-Pin Header	1	P3
.....4	550-214	Connector, breakaway header Molex 22-28- 4361	0.167	
.....3	700-0119	TAPE,KAPTON 1/4	0.001	
.....3	700-226-59	RF Shielding Fence For Power Amplifier(Interior)	1	
.....3	700-268	Leader Tech Fence # 47-CBSU-2.75 X 5.75 X .4 NO COVER	1	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	949-0365	CABLE, RF OUTPUT, SRPT-40A (SBCM)	1	
.....3	550-037	CONNECTOR, UG-58A/U N PANEL RECEPTICLE	1	
.....3	550-057	Connector, UG-177/U UHF hood Amphenol 83-765	1	
.....3	621-1359	CBL,COAX,RG316/U,50 OHM	0.33	
....2	959-0321	ASSY., THERMOCOUPLE	1	
.....3	120-002	THERMISTOR, 1000 OHM @ 25C 10%	1	
.....3	512-002	Terminal, vinyl insulated C10 #10 stud #10-12 wire	1	
....2	DB61024	Washer, TO-220 Shoulder NYL Thermalloy #7721-7PPS	3	

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	953-2140-453	PA ASSY, 450MHZ, 30W, SRPT/STL, 2ND GEN (*NOTE*)	1	
....2	270-407-1	Capacitor,SMT,size 1206,4.7pF,COG,100V Kemet C1206C479C1GAC	3	C35, C36, C37
....2	350-192	INDUCTOR, 12.5nH, SMT, 1206	2	L8, L11
....2	350-194	INDUCTOR, 18.5nH, SMT, 1206	2	L9, L10
....2	401-338	IC, SMT, REGULATOR, 5 AMP, LM338T *NOTE*	3	U5, U6, U7
....2	407-0036	INSULATOR,MICA,TO-220,56-77-11	3	INS1, INS2, INS3
....2	422-6107	SCREW,SEMS 6-32 X 7/16 PAN PH.ST."	2	
....2	423-4001	#4 FLAT SS .250 X .125 X .018	3	
....2	423-6003	#6 LOCK INT TOOTH	5	
....2	441-0184	STOFF,6-32,MALE-FEMALE,3/8	5	
....2	468-0760-006	PA MODULE, 45W, 12.5V, 440-520 MHZ	1	U3
....2	500-211	Screw,SEMS 4-40x3/8 Ph Pan Head MS Black Zinc (External)	3	
....2	520-050D5	Heatsink, Drilled For SRPT-30/40A (SBCM)	1	
.....3	520-050	HEATSINK, THERMALLOY 10871 UX3.000 DEBURRED, PLAIN FINISH	1	
....2	594-0503	LABEL, DANGER-HAZARDOUS VOLTAGE	1	
....2	913-2140	RF PA BD ASSY 2ND GEN PA MODULES SRPT/STL(SBCM)	1	A1
.....3	108-502	Potentiometer, 5K ohms, SMT, Bourns 3224W-1-502E	3	R5, R17, R20
.....3	184-001	Resistor, SMT, 3 Watt, 0.1 ohm 1%, Dale WSR-3-.1-1%	3	R8, R9, R10
.....3	184-005	Resistor,SMT, 3Watt. 0.05 ohms, Dale WSR-3-.05-1%	2	R3, R18
.....3	185-000	Resistor,0 Ohm 1206 Chip Mfg# DALCRCW1206000ZT-X	1	R37
.....3	185-1.21K	Resistor, SMT, size 1206, 1.21K ohms, Dale CRCW1206-1.21K	2	R19, R28
.....3	185-101	RESISTOR, 1/8 W 100 OHM CHIP 5%	1	R7
.....3	185-102	Resistor, 1K ohm 1/8 watt 1% chip Dale CRCW1206-1K	3	R12, R14, R33
.....3	185-103	Resistor, 10K ohm 1/8 watt 1% chip Dale CRCW1206-10K	3	R21, R24, R32
.....3	185-2.21K	RES,2.21K OHM,1%,0.25W,1206	1	R34
.....3	185-22.1K	Resistor, SMT, 1206, 22.1K, Dale CRCW1206-22.1K	2	R11, R29
.....3	185-274	Resistor, SMT, 1206, 274 ohm, Dale CRCW1206-274	2	R2, R15
.....3	185-3.32K	Resistor, SMT, 1206, 3.32K, Dale CRCW1206-3.32K	1	R31
.....3	185-330-1	RESISTOR, SMT, 1206, 33.2 OHM, 1%	1	R23
.....3	185-392	Resistor, SMT, size 1206, 392 ohms, Dale CRCW1206-392	1	R6
.....3	185-4.75K	Resistor, SMT, 1206, 4.75K, Dale CRCW1206-4.75K	2	R4, R25
.....3	185-47.5K	Resistor, SMT, size 1206, 47.5K ohms, Dale CRCW1206-47.5K	1	R13



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	185-475	Resistor, SMT, Size 1206, 475 ohms, Dale CRCW1206-475	1	R27
.....3	185-51.1	Resistor, SMT, 1206, 51.1 ohm, Dale CRCW1206-51.1	1	R22
.....3	210-1047	DIODE,ZENER,4.7V,225MW,SMD,SOT23	1	D6
.....3	216-0056	TRANS, PNP, MMBTA56, SOT-23	1	Q1
.....3	270-102	Cap,monolithic,1000pf 50v 5%KemetC1206C102J5GACTR marked	10	C19, C23, C25, C26, C27, C28, C30, C32, C33, C34
.....3	270-104	Capacitor, Monolithic Chip 100000pF 1% C1206C104J5RAC Kemet	1	C24
.....3	270-472	CAP, SMT, 1206, 4700 PF, COG, 50V (NOTE)	2	C7, C39
.....3	298-105	Cap SMT 1mF 16V Tantalum Kemet T491A105M016AS	5	C17, C18, C21, C22, C40
.....3	298-106	Cap., Tantalum, SMT, Size B, 10uF, 16V,Kemet T491B106K016AS	1	C8
.....3	298-107	Cap.,Tantalum,SMT, Size D, 100uF, 16V,Kemet T491X107K016AS	1	C31
.....3	298-336	Cap.,Tantalum,SMT,Size C, 33uF,16V,Sprague T491C336K016AS	2	C20, C29
.....3	350-191	Inductor, SMT, 1008, 330nH, Coilcraft 1008CS- 331XKBC	1	L7
.....3	350-196	Inductor, SMT, Power, 0.68, Coilcraft DO3316P-681HC	1	L1
.....3	400-295	IC,OP-AMP, GENERAL PURPOSE, OP295GS	1	U8
.....3	400-495	IC, SMT, OP-AMP, QUAD, RAIL TO RAIL	1	U1
.....3	410-305	Diode, Motorola MMBD101L chip	2	D3, D4
.....3	415-222	Diode, Zener, SMT, 2.5V, Motorola MMSZ5222BT1	1	D5
.....3	418-447	Diode, SMT, Zener, 4.7V, Motorola BZX84C4V7LT1	1	D7
.....3	420-907	TRANSISTOR, GENERAL PURPOSE PNP, SMT, MMBT2907ALT1	1	Q2
.....3	439-041	TRANSISTOR, SMT, GENERAL PURPOSE, NPN	1	Q3
.....3	513-2140	PCB MACH 2ND GEN PA BD ASSY SRPT/STL	1	
.....3	550-138	Connector, 8 pin Molex header (cut from 550- 162)	1	P1
.....4	550-162	Connector, 24 pin break-away (straight) Molex 26-48-6248	0.333	
.....3	550-193	CONNECTOR, S.FL2-R-SMT SURFACE MOUNT	1	P2
.....3	550-324	Connector,6-Pin Header	1	P3
.....4	550-214	Connector, breakaway header Molex 22-28- 4361	0.167	
.....3	700-0119	TAPE,KAPTON 1/4	0.001	
.....3	700-226-59	RF Shielding Fence For Power Amplifier(Interior)	1	
.....3	700-268	Leader Tech Fence # 47-CBSU-2.75 X 5.75 X .4 NO COVER	1	
....2	949-0365	CABLE, RF OUTPUT, SRPT-40A (SBCM)	1	

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	550-037	CONNECTOR, UG-58A/U N PANEL RECEPTICLE	1	
.....3	550-057	Connector, UG-177/U UHF hood Amphenol 83-765	1	
.....3	621-1359	CBL,COAX,RG316/U,50 OHM	0.33	
....2	959-0321	ASSY., THERMOCOUPLE	1	
.....3	120-002	THERMISTOR, 1000 OHM @ 25C 10%	1	
.....3	512-002	Terminal, vinyl insulated C10 #10 stud #10-12 wire	1	
....2	DB61024	Washer, TO-220 Shoulder NYL Thermalloy #7721-7PPS	3	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	953-2140-952	PA ASSY, 950MHZ, 20W, SRPT/STL, 2ND GEN (*NOTE*)	1	
....2	270-202	Cap,monolithic chip 2.2pF 100V .25pf% Kemet C1206C229C1GACTR	3	C35, C36, C37
....2	350-198	INDUCTOR, SMT, 1206, 5NH	2	L8, L11
....2	350-199	INDUCTOR, SMT, 1206, 8nH	2	L9, L10
....2	401-338	IC, SMT, REGULATOR, 5 AMP, LM338T *NOTE*	3	U5, U6, U7
....2	407-0036	INSULATOR,MICA,TO-220,56-77-11	3	INS1, INS2, INS3
....2	422-6107	SCREW,SEMS 6-32 X 7/16 PAN PH.ST."	2	
....2	423-4001	#4 FLAT SS .250 X .125 X .018	3	
....2	423-6003	#6 LOCK INT TOOTH	5	
....2	441-0184	STOFF,6-32,MALE-FEMALE,3/8	5	
....2	468-0760-007	PA MODULE, 20W, 12.5V, 896-941 MHZ	1	U3
....2	500-211	Screw,SEMS 4-40x3/8 Ph Pan Head MS Black Zinc (External)	3	
....2	520-050D5	Heatsink, Drilled For SRPT-30/40A (SBCM)	1	
.....3	520-050	HEATSINK, THERMALLOY 10871 UX3.000 DEBURRED, PLAIN FINISH	1	
....2	594-0503	LABEL, DANGER-HAZARDOUS VOLTAGE	1	
....2	913-2140	RF PA BD ASSY 2ND GEN PA MODULES SRPT/STL(SBCM)	1	A1
.....3	108-502	Potentiometer, 5K ohms, SMT, Bourns 3224W-1-502E	3	R5, R17, R20
.....3	184-001	Resistor, SMT, 3 Watt, 0.1 ohm 1%, Dale WSR-3-.1-1%	3	R8, R9, R10
.....3	184-005	Resistor,SMT, 3Watt. 0.05 ohms, Dale WSR-3-.05-1%	2	R3, R18
.....3	185-000	Resistor,0 Ohm 1206 Chip Mfg# DALCRCW1206000ZT-X	1	R37
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.....3	185-101	RESISTOR, 1/8 W 100 OHM CHIP 5%	1	R7
.....3	185-102	Resistor, 1K ohm 1/8 watt 1% chip Dale CRCW1206-1K	3	R12, R14, R33
.....3	185-103	Resistor, 10K ohm 1/8 watt 1% chip Dale CRCW1206-10K	3	R21, R24, R32
.....3	185-2.21K	RES,2.21K OHM,1%,0.25W,1206	1	R34
.....3	185-22.1K	Resistor, SMT, 1206, 22.1K, Dale CRCW1206-22.1K	2	R11, R29
.....3	185-274	Resistor, SMT, 1206, 274 ohm, Dale CRCW1206-274	2	R2, R15
.....3	185-3.32K	Resistor, SMT, 1206, 3.32K, Dale CRCW1206-3.32K	1	R31
.....3	185-330-1	RESISTOR, SMT, 1206, 33.2 OHM, 1%	1	R23
.....3	185-392	Resistor, SMT, size 1206, 392 ohms, Dale CRCW1206-392	1	R6
.....3	185-4.75K	Resistor, SMT, 1206, 4.75K, Dale CRCW1206-4.75K	2	R4, R25
.....3	185-47.5K	Resistor, SMT, size 1206, 47.5K ohms, Dale CRCW1206-47.5K	1	R13

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	185-475	Resistor, SMT, Size 1206, 475 ohms, Dale CRCW1206-475	1	R27
.....3	185-51.1	Resistor, SMT, 1206, 51.1 ohm, Dale CRCW1206-51.1	1	R22
.....3	210-1047	DIODE,ZENER,4.7V,225MW,SMD,SOT23	1	D6
.....3	216-0056	TRANS, PNP, MMBTA56, SOT-23	1	Q1
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.....3	270-104	Capacitor, Monolithic Chip 100000pF 1% C1206C104J5RAC Kemet	1	C24
.....3	270-472	CAP, SMT, 1206, 4700 PF, COG, 50V (NOTE)	2	C7, C39
.....3	298-105	Cap SMT 1mF 16V Tantalum Kemet T491A105M016AS	5	C17, C18, C21, C22, C40
.....3	298-106	Cap., Tantalum, SMT, Size B, 10uF, 16V,Kemet T491B106K016AS	1	C8
.....3	298-107	Cap.,Tantalum,SMT, Size D, 100uF, 16V,Kemet T491X107K016AS	1	C31
.....3	298-336	Cap.,Tantalum,SMT,Size C, 33uF,16V,Sprague T491C336K016AS	2	C20, C29
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.....3	350-196	Inductor, SMT, Power, 0.68, Coilcraft DO3316P-681HC	1	L1
.....3	400-295	IC,OP-AMP, GENERAL PURPOSE, OP295GS	1	U8
.....3	400-495	IC, SMT, OP-AMP, QUAD, RAIL TO RAIL	1	U1
.....3	410-305	Diode, Motorola MMBD101L chip	2	D3, D4
.....3	415-222	Diode, Zener, SMT, 2.5V, Motorola MMSZ5222BT1	1	D5
.....3	418-447	Diode, SMT, Zener, 4.7V, Motorola BZX84C4V7LT1	1	D7
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.....3	550-193	CONNECTOR, S.FL2-R-SMT SURFACE MOUNT	1	P2
.....3	550-324	Connector,6-Pin Header	1	P3
.....4	550-214	Connector, breakaway header Molex 22-28- 4361	0.167	
.....3	700-0119	TAPE,KAPTON 1/4	0.001	
.....3	700-226-59	RF Shielding Fence For Power Amplifier(Interior)	1	
.....3	700-268	Leader Tech Fence # 47-CBSU-2.75 X 5.75 X .4 NO COVER	1	
....2	949-0365	CABLE, RF OUTPUT, SRPT-40A (SBCM)	1	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	550-037	CONNECTOR, UG-58A/U N PANEL RECEPTICLE	1	
.....3	550-057	Connector, UG-177/U UHF hood Amphenol 83-765	1	
.....3	621-1359	CBL,COAX,RG316/U,50 OHM	0.33	
....2	959-0321	ASSY., THERMOCOUPLE	1	
.....3	120-002	THERMISTOR, 1000 OHM @ 25C 10%	1	
.....3	512-002	Terminal, vinyl insulated C10 #10 stud #10-12 wire	1	
....2	DB61024	Washer, TO-220 Shoulder NYL Thermalloy #7721-7PPS	3	

13 RF TECHNICAL SERVICES CONTACT INFORMATION

RF Technical Services -

Telephone: **(217) 224-9617**

E-Mail: rfservice@bdcast.com

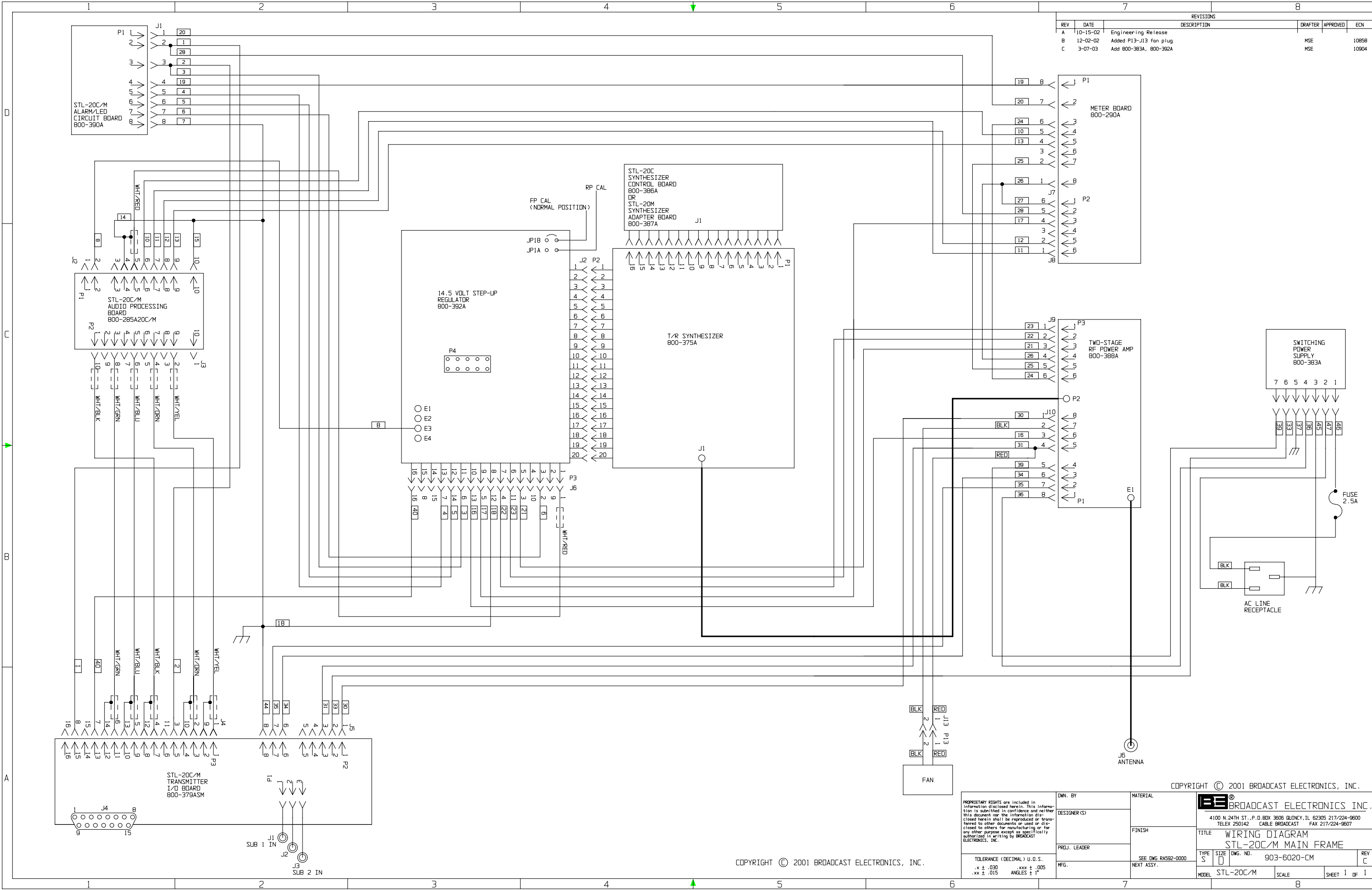
Fax: **(217) 224-6528**

web: www.bdcast.com

14 SCHEMATICS

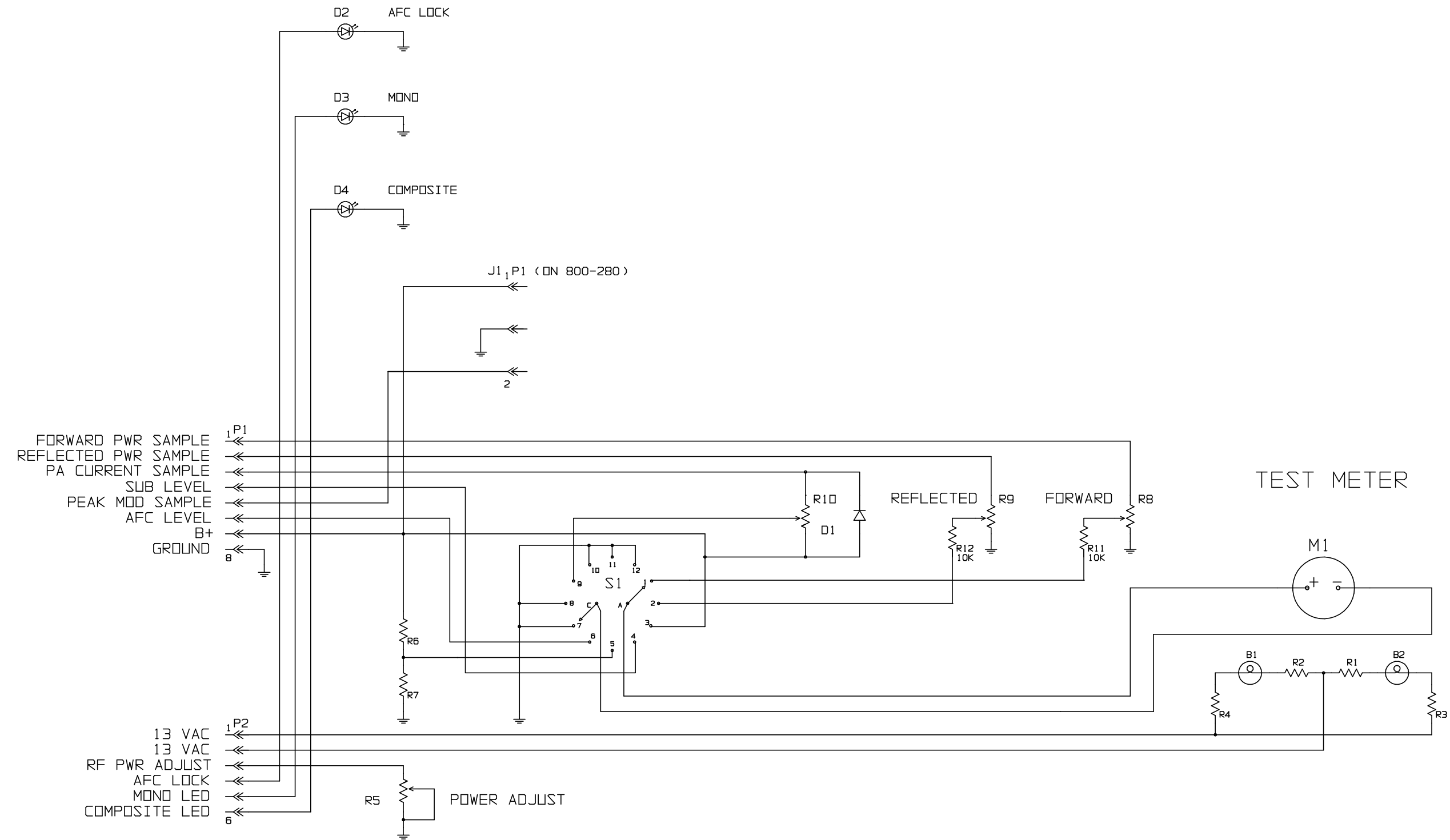
The following pages present the STL 20M, STL 20C Transmitter drawings.





C 3-18-03 CHGD R1-R4 TO 15 OHM KT ECN 10904
D 4-1-03 ADDED R11 & R12 KT ECN10935
E 1-24-05 CHGD R11 & R12 TO 145-562 KT ECN 11244

FRONT PANEL
LED INDICATORS

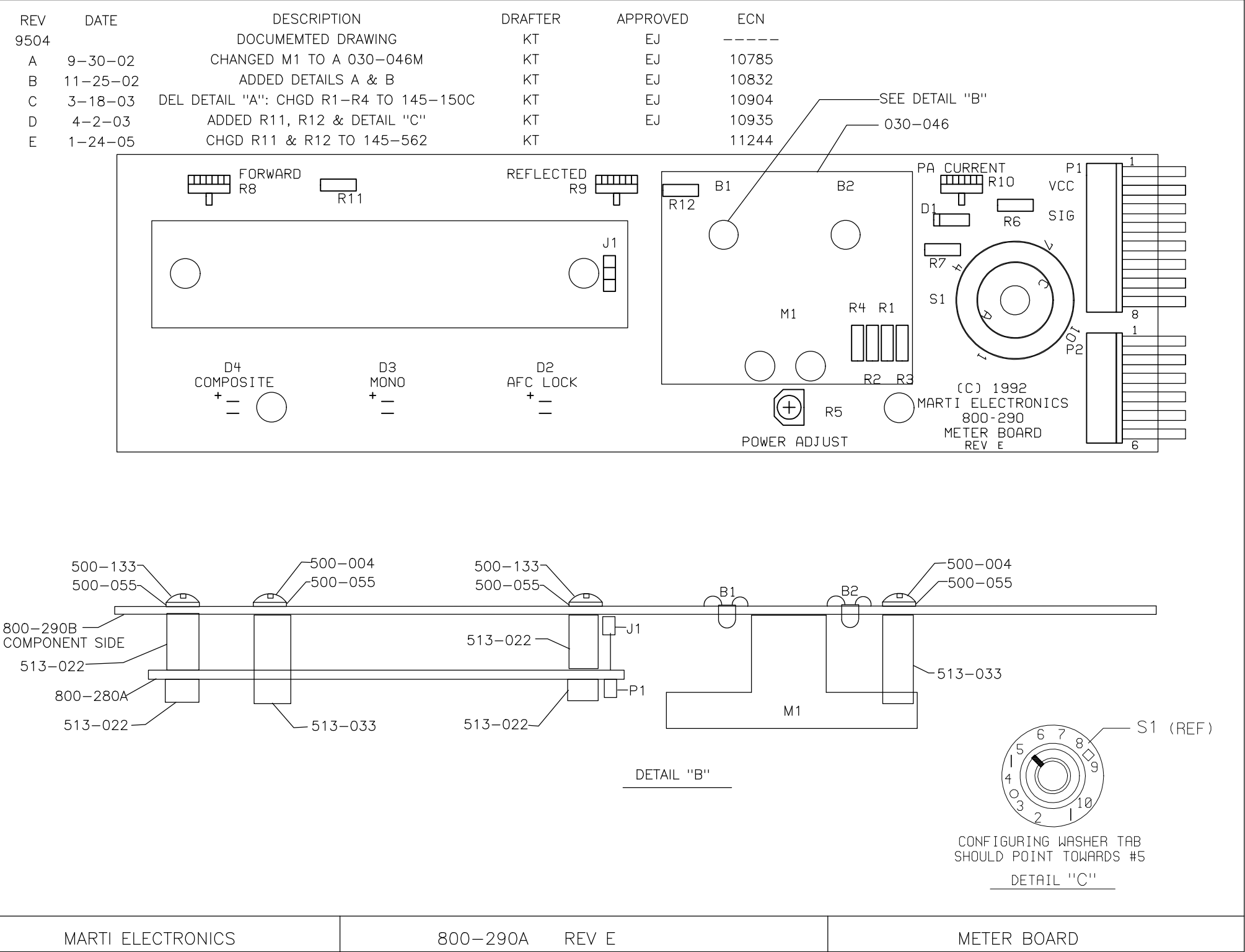


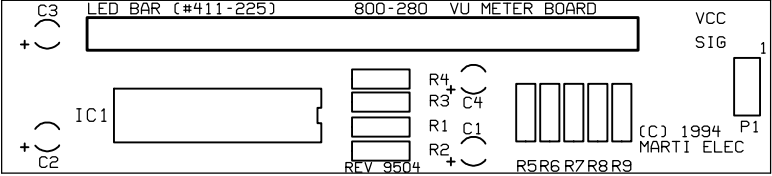
MARTI ELECTRONICS
CLEBURNE, TX 76033-0661

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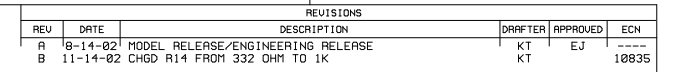
800-290
REV E


TITLE
STL METER BOARD



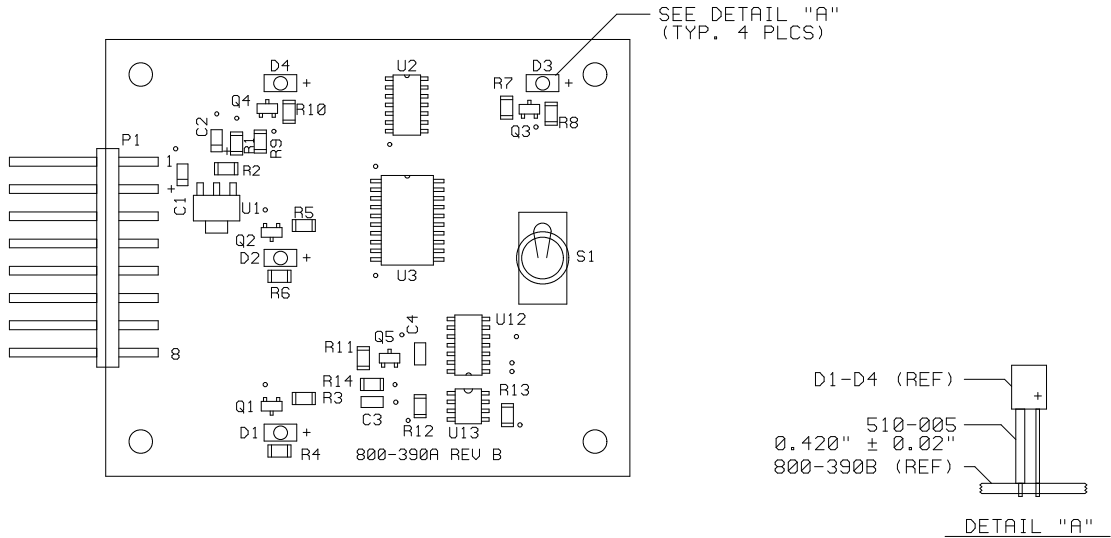


MARTI ELECTRONICS
METER BOARD
800-280 REV 9504




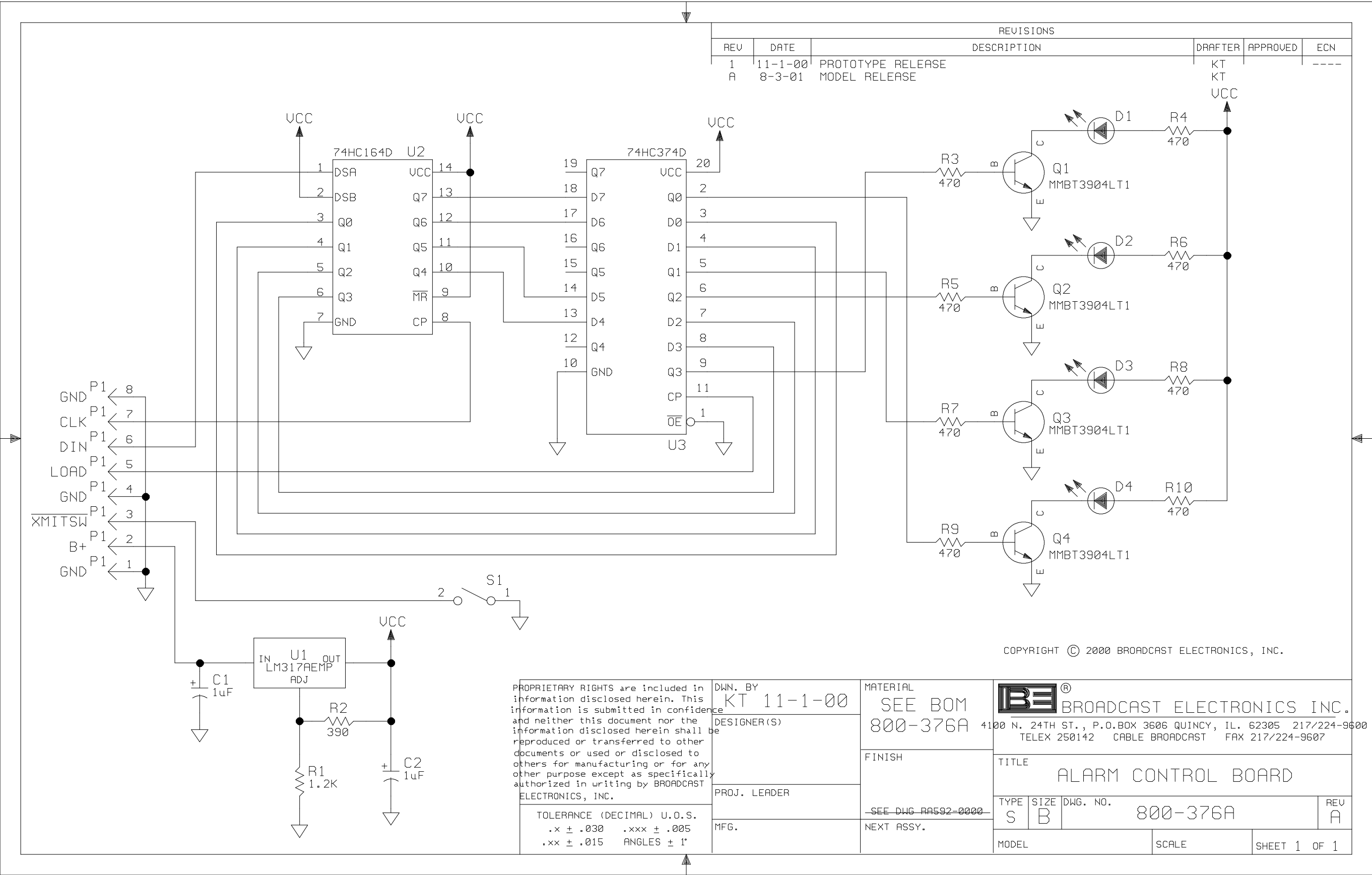
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TOLERANCE (DECIMAL) U.O.S. .xxx ± .030 .xxx ± .005 .xxx ± .015 ANGLES ± .8°		PROJ. LEADER		FINISH		TITLE ALARM/LED BOARD	
MFG.		NEXT ASSY.		TYPE S D		Dwg. NO. 800-390A	
				MODEL STD-28C/M		SCALE 1 OF 1	

REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
A	8-14-02	MODEL RELEASE/ENGINEERING RELEASE	KT	EJ	-----
B	11-14-02	CHGD R14 FROM 185-332 TO 185-102	KT		10835

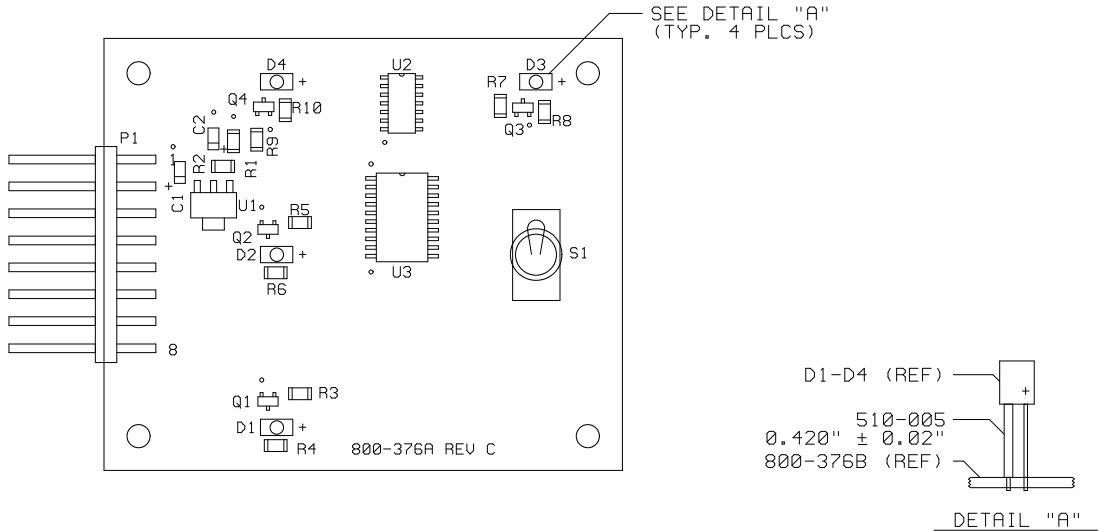


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	DESIGNER(S)		TITLE ALARM/LED BOARD				
	PROJ. LEADER	FINISH	TYPE A	SIZE B	DWG No. 800-390A	REV B	
	TOLERANCE (DECIMAL) U.O.S. .X ± .030 .XXX ± .005 .XX ± .015 ANGLES + 1°	MFG.	NEXT ASSY.	MODEL STL-20C/M			SCALE 1/1



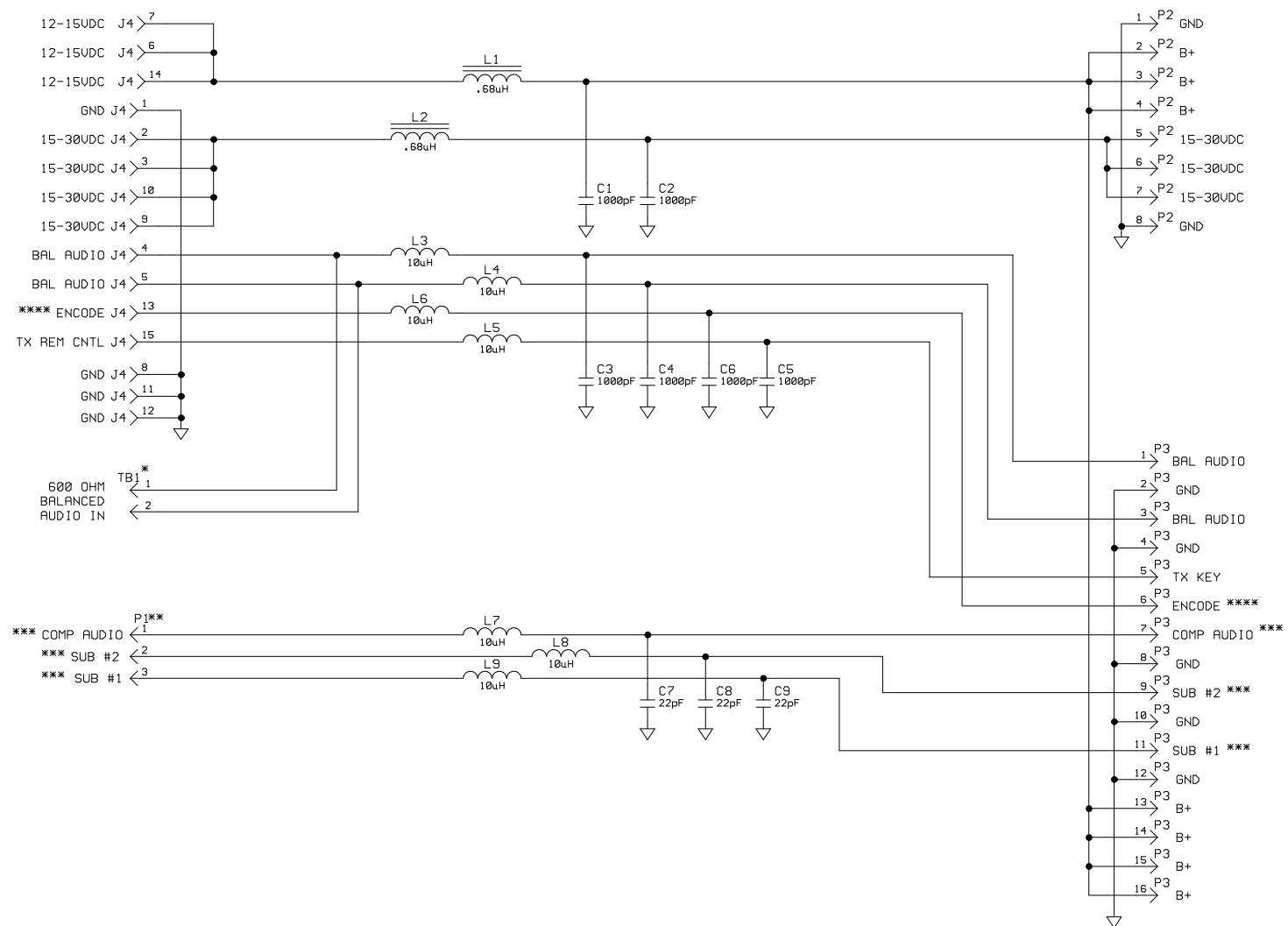
REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	11-2-00	PROTOTYPE RELEASE	KT		-----
A	8-2-01	ADDED FIDUCIALS, MOVED D1 AREA, MODEL RELEASE	KT		-----
B	9-4-01	ADDED POLARITY MARKS FOR C1 & C2	KT		10537
C	12-11-01	CLEARED SOLDERMASK FROM FIDUCIALS	KT	EJ	10588



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	DESIGNER(S)	FINISH			
	PROJ. LEADER	NEXT ASSY.	TITLE ALARM CONTROL BOARD		
	MFG.		TYPE A	SIZE B	DWG No. 800-376A
TOLERANCE (DECIMAL) U.O.S. .X ± .030 .XXX ± .005 .XX ± .015 ANGLES + 1°		MODEL NNNN		SCALE 1/1	SHEET 1 OF 1


REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	3-8-01	PROTOTYPE RELEASE	JAH	EJ	---
2	4-3-01	PROTOTYPE CHANGES	KT	EJ	---
A	5-23-01	ENGINEERING RELEASE	KT	EJ	---
B	3-10-03	ADDED 800-379ASM	KT		10921



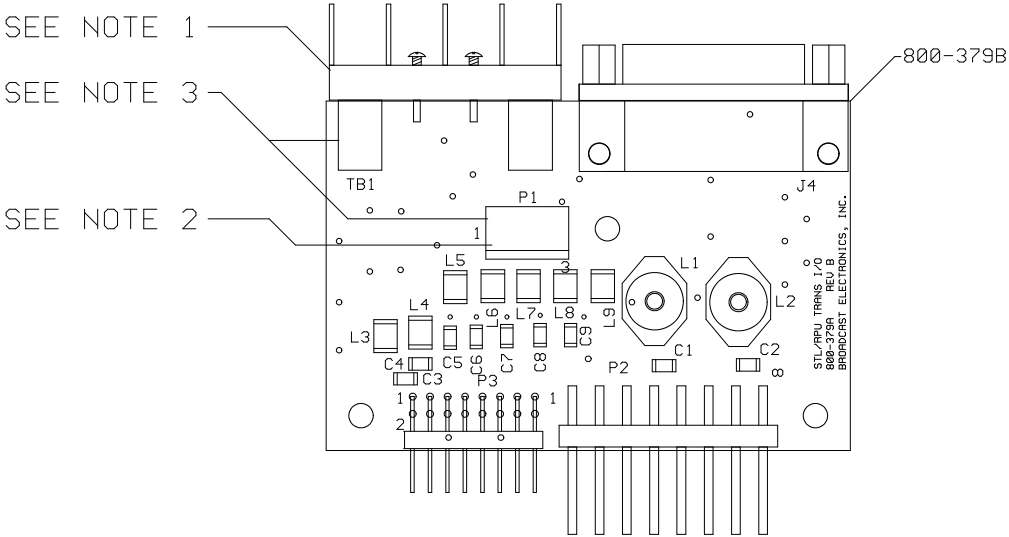
- NOTES:
- *- ONLY USED ON 800-379AS
 - ** - ONLY USED ON 800-379AS/ASM
 - *** - SIGNAL NOT USED ON RPU
 - **** - SIGNAL NOT USED ON STL
 - LAST COMPONENT USED: C11, L11, P3, J4, TB1
 - COMPONENTS NOT USED: J1-J3
 - SEE ASSEMBLY: 800-379A (R/S/SM)

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	DESIGNER(S) ERIC JACKSON	FINISH	
	PROJ. LEADER ERIC JACKSON		
	MFG.	NEXT ASSY. SEE NOTE 4	
TOLERANCE (DECIMAL) U.O.S. .xx ± .030 .xxx ± .005 .xx ± .015 ANGLES ± 1°		MODEL ---	SCALE NONE
		SHEET 1 OF 1	

REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	3-13-01	PROTOTYPE RELEASE	JAH	EJ	---
2	4-4-01	PROTOTYPE CHANGES	KT	EJ	---
A	5-23-01	ENGINEERING RELEASE	KT	EJ	---
B	3-10-03	ADDED NOTES & 800-379ASM	KT		10921

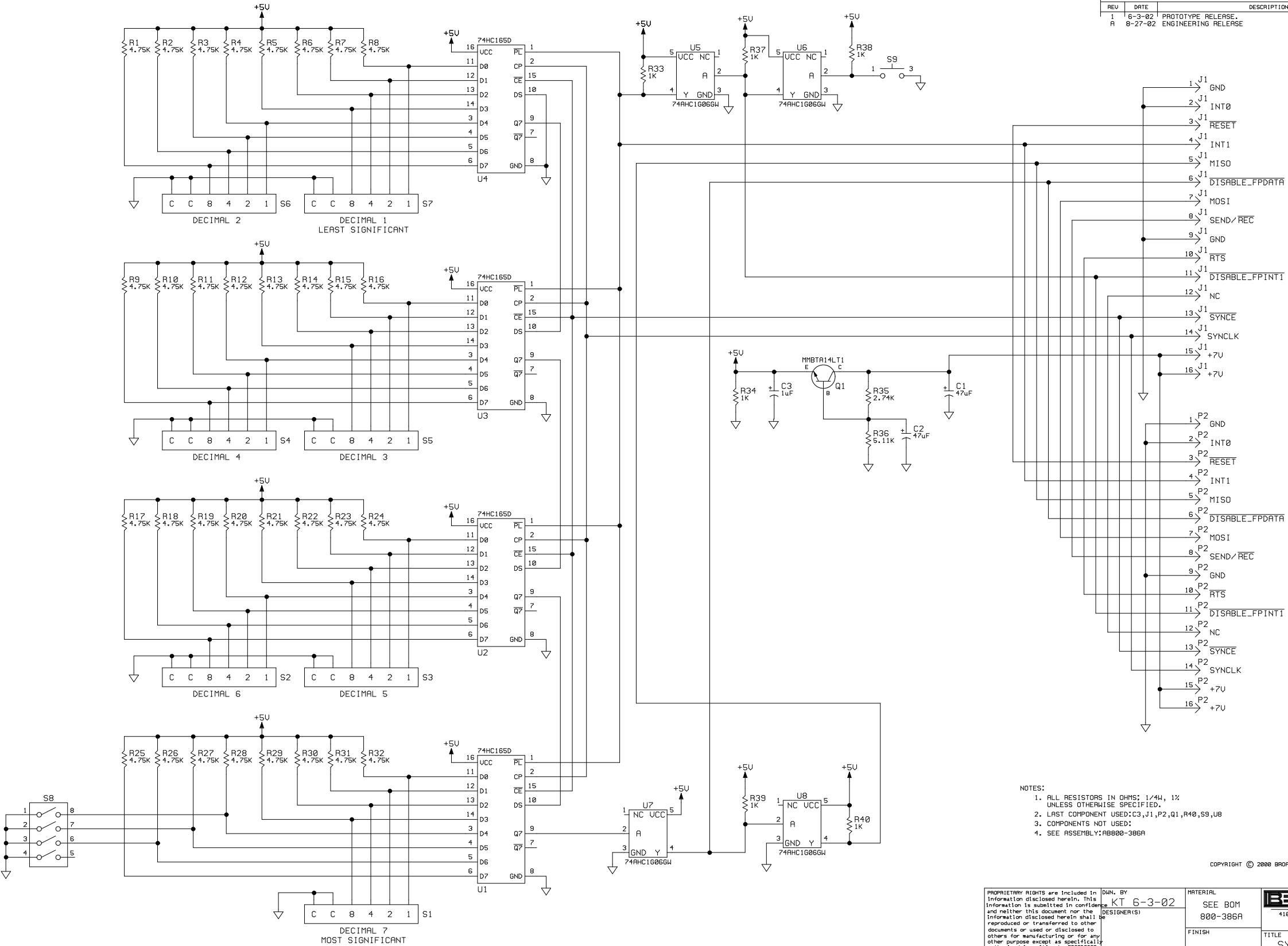


- NOTES:
- 1) TB1 USED ON 800-379AS ONLY.
 - 2) P1 USED ON 800-379AS\ASM ONLY.
 - 3) TB1 & P1 NOT USED ON 800-379AR.

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	DESIGNER(S) ERIC JACKSON				
	PROJ. LEADER ERIC JACKSON	FINISH	TITLE PCB ASSY STL/RPU TRANS I/O BD		
	MFG.	NEXT ASSY.	TYPE A	SIZE B	DWG No. 800-379A(R/S/SM)
	TOLERANCE (DECIMAL) U.O.S. .X ± .030 .XXX ± .005 .XX ± .015 ANGLES + 1°		MODEL NNNN	SCALE 1/1	SHEET 1 OF 1

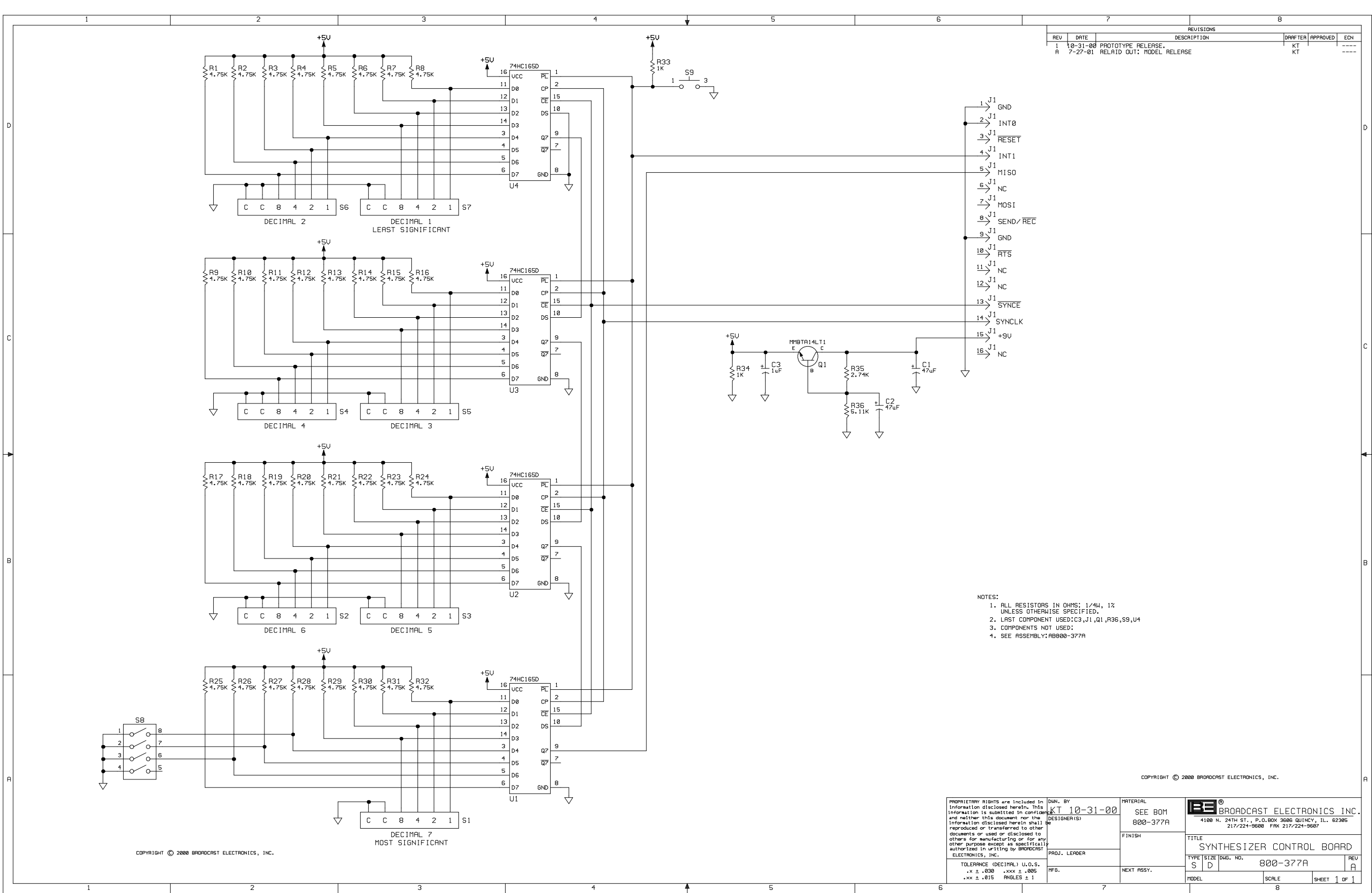
REVISIONS				DRAFTER	APPROVED	ECN
REV	DATE	DESCRIPTION				
1	6-3-02	PROTOTYPE RELEASE		KT		10758
A	8-27-02	ENGINEERING RELEASE				



- NOTES:
1. ALL RESISTORS IN OHMS: 1/4W, 1% UNLESS OTHERWISE SPECIFIED.
 2. LAST COMPONENT USED: C3, J1, P2, Q1, R40, S9, U8
 3. COMPONENTS NOT USED:
 4. SEE ASSEMBLY: AB800-386A

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	KT 6-3-02	SEE BOM 800-386A			
	DESIGNER(S)				
		FINISH	TITLE		
			SYNTHESIZER CONTROL BOARD		
TOLERANCE (DECIMAL) U.O.S. .x ± .030 .xxx ± .005 .xx ± .015 ANGLES ± 1°	PROJ. LEADER		TYPE SIZE DWS. NO.		REV
	MFG.	NEXT ASSY.	S D 800-386A		A
			MODEL	SCALE	SHEET 1 OF 1

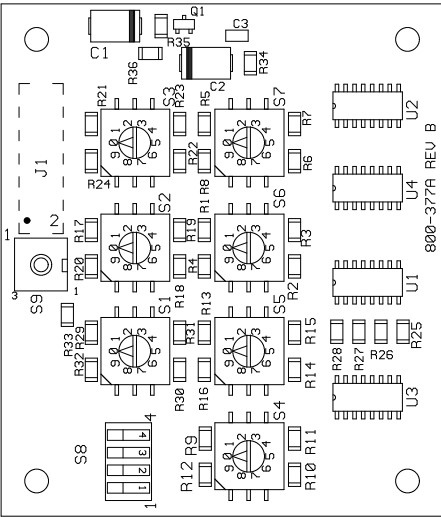


REVISIONS				
REV	DATE	DESCRIPTION	DRAWN	APPROVED
1	10-31-00	PROTOTYPE RELEASE	KT	----
A	7-27-01	RELAYD OUT: MODEL RELEASE	KT	----

- NOTES:
1. ALL RESISTORS IN OHMS: 1/4W, 1% UNLESS OTHERWISE SPECIFIED.
 2. LAST COMPONENT USED: C3, J1, Q1, R36, S9, U4
 3. COMPONENTS NOT USED:
 4. SEE ASSEMBLY: AB800-377A

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TOLERANCE (DECIMAL) U.O.S. .x ± .030 .xxx ± .005 .xx ± .015 ANGLES ± 1		DESIGNER(S) PROJ. LEADER	FINISH NEXT ASSY.	
TITLE SYNTHESIZER CONTROL BOARD		TYPE S	SIZE D	DWG. NO. 800-377A
MODEL		SCALE	SHEET 1 OF 1	

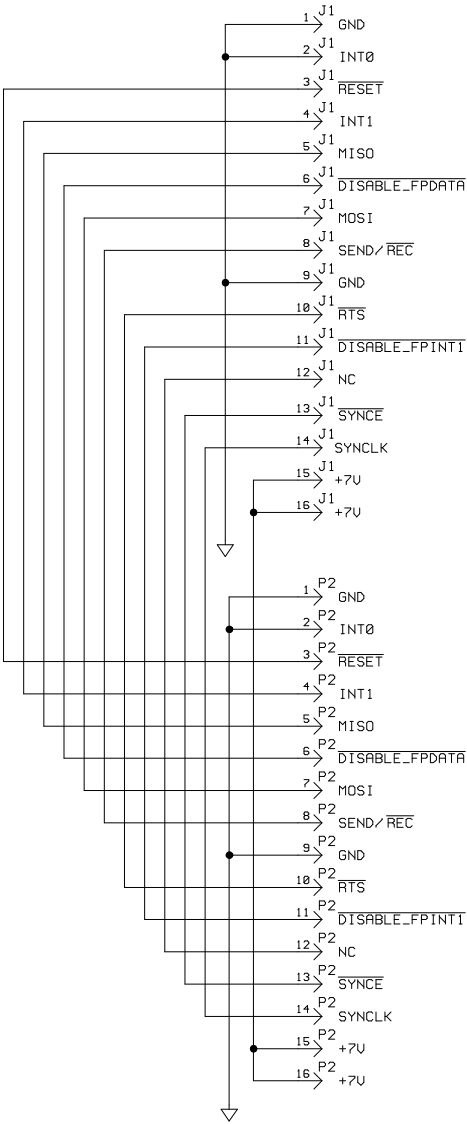


REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	11-1-00	PROTOTYPE RELEASE	KT		-----
2	1-5-01	CHGD S1, S2 & S3 TO SURFACE MOUNT	KT		-----
A	8-3-01	MADE BOARD BIGGER, RELAID OUT; MODEL RELEASE	KT	EJ	-----
B	12-6-01	RELAID OUT BOARD	KT		10586

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	DESIGNER(S) ERIC JACKSON				
	PROJ. LEADER ERIC JACKSON	FINISH	TITLE SYNTHESIZER CONTROL BOARD		
	MFG.	NEXT ASSY.	TYPE A	SIZE B	DWG No. 800-377A
TOLERANCE (DECIMAL) U.O.S. .X ± .030 .XXX ± .005 .XX ± .015 ANGLES + 1°			REV B	MODEL NNNN	SCALE 1/1
					SHEET 1 OF 1

REVISIONS							
REV	DATE	DESCRIPTION			DRAFTER	APPROVED	ECN
1	6-25-02	PROTOTYPE RELEASE.			KT		----
A	9-25-02	ENGINEERING RELEASE WITHOUT CHANGE			KT		----

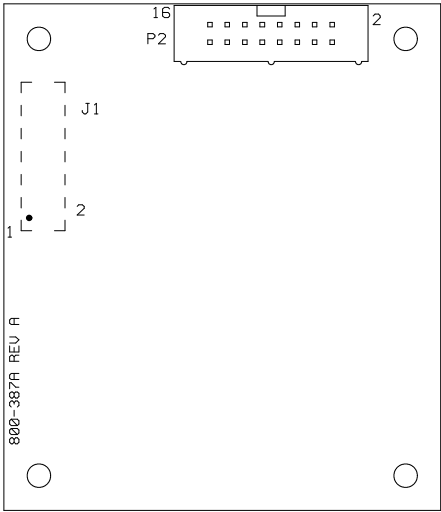


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	DESIGNER(S)	FINISH	TITLE SYNTHESIZER ADAPTER BOARD	
	PROJ. LEADER		TYPE SIZE (Dwg. No.) S D 800-387A	REV A
	NFG.	NEXT ASSY.	MODEL STL-20M	SCALE SHEET 1 OF 1
TOLERANCE (DECIMAL) U.O.S. .x ± .030 .xxx ± .005 .xx ± .015 ANGLES ± 1°				

REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	6-25-02	PROTOTYPE RELEASE	KT		-----
A	9-25-02	ENGINEERING RELEASE WITHOUT CHANGE	KT		-----

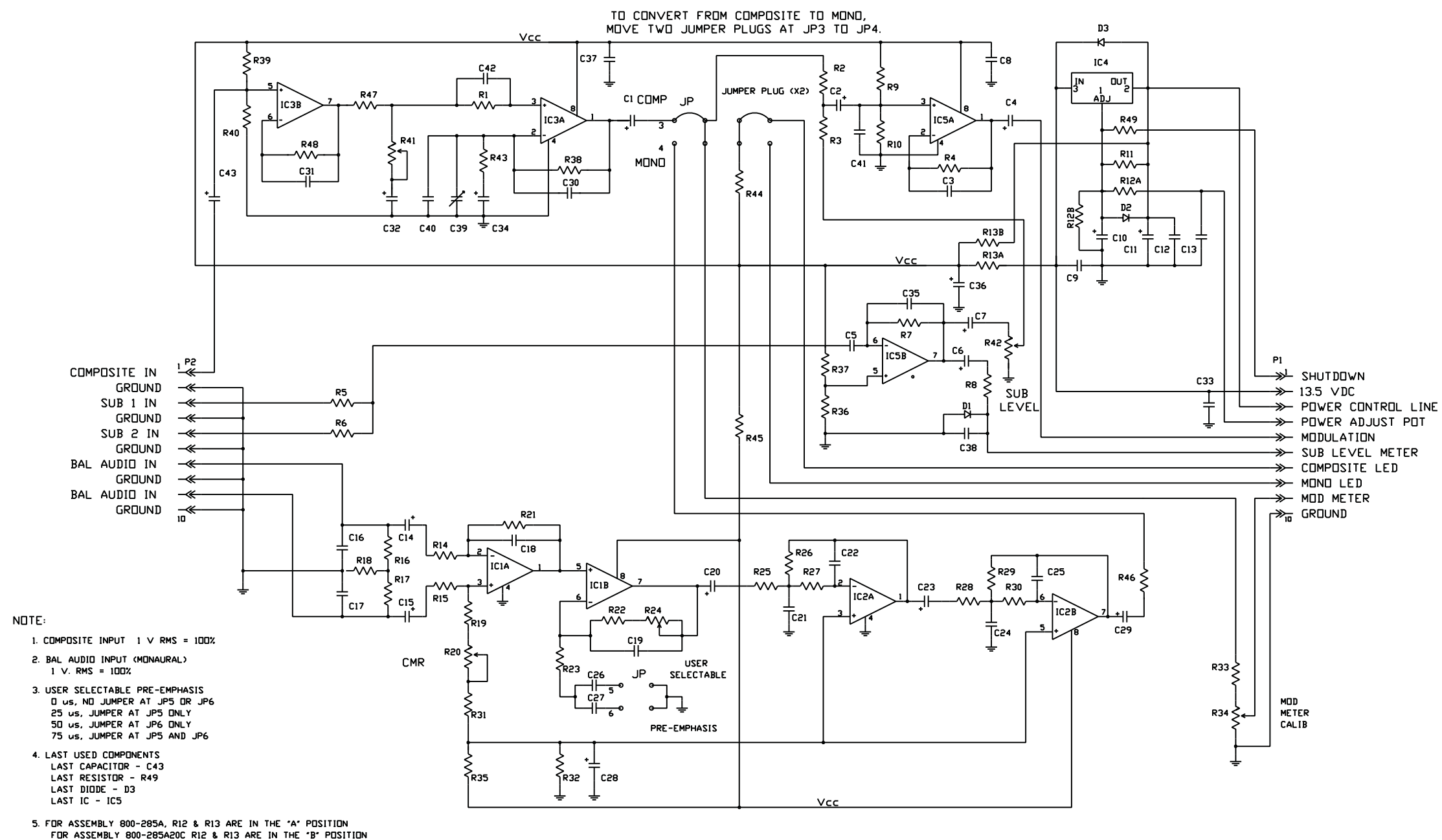


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	DESIGNER(S) ERIC JACKSON				
	PROJ. LEADER ERIC JACKSON	FINISH	TITLE SYNTHESIZER ADAPTER BOARD		
	MFG.	NEXT ASSY.	TYPE A	SIZE B	DWG No. 800-387A
TOLERANCE (DECIMAL) U.O.S. .X ± .030 .XXX ± .005 .XX ± .015 ANGLES + 1°				REV A	
			MODEL STL-20M	SCALE 1/1	SHEET 1 OF 1

REV	DATE	DESCRIPTION
A	12-4-01	CHGD R12 TO R12A & R12B, CHGD R13 TO R13A & R13B
B	1-30-06	CHG'D C26 (215-102) C27 (215-202) R21,R31

DRAFTER	APPROVED	ECN
KT		10571
JTB		11391



MARTI ELECTRONICS
CLEBURNE, TX 76033-0661

DRAWING NO.
COPYRIGHT
<DATE> 800-285 REV B

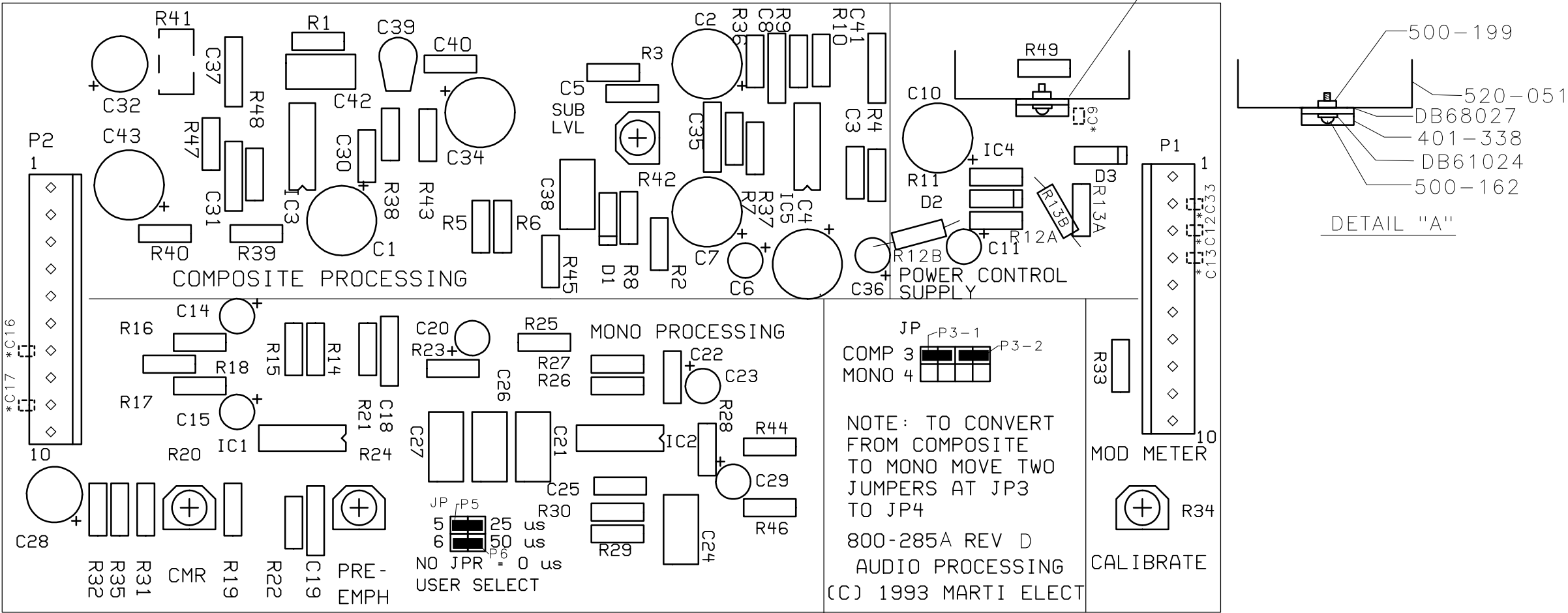
TITLE
STL-15C/20C AUDIO PROCESSING BOARD

REV A 12-4-01 ADDED A20C; CHGD R12 TO R12A & R12B, R13 TO R13A & R13B KT 10571

REV B 8-23-02 ADDED BOARD NUMBER KT 10711

REV C 9-6-02 ADDED DETAIL "A" AND SHOWED CAPS ON BOTTOM KT 10750

REV D 1-30-06 CHG C26,C27,R21,R31 (VALUE CHG;S) JTB 11391

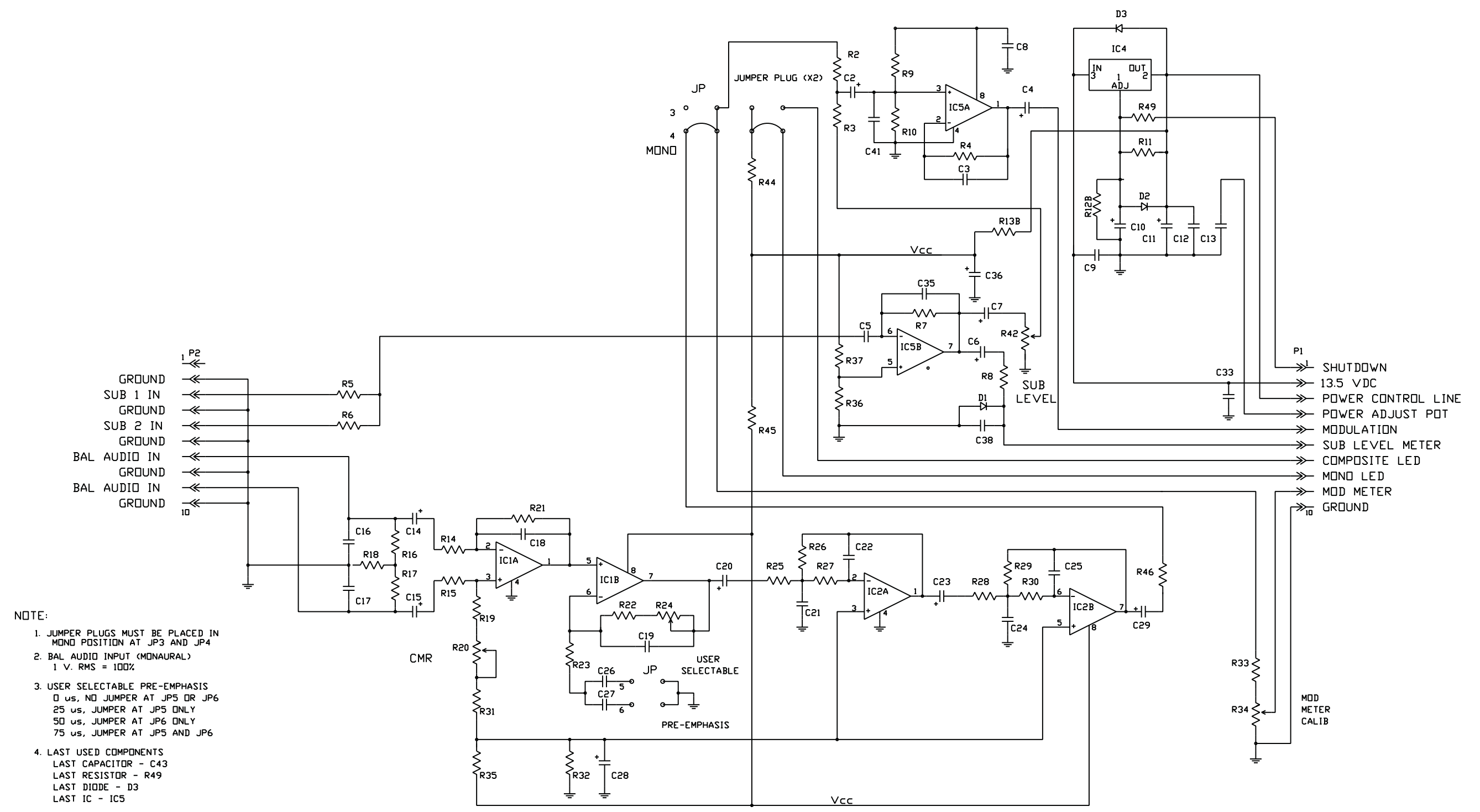


NOTES:

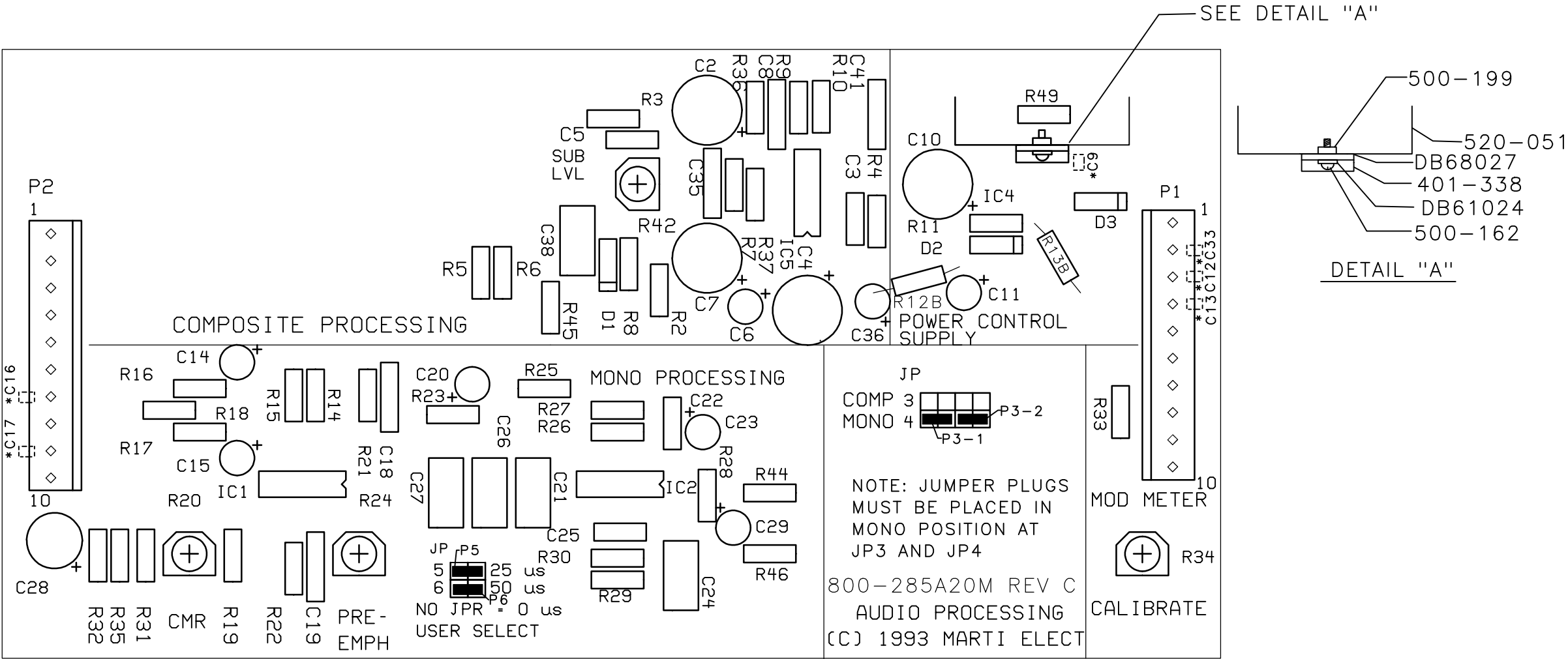
- 1) FOR ASSEMBLY 800-285A USE R12A & R13A.
FOR ASSEMBLY 800-285A20C USE R12B & R12B.
- 2) * INDICATES COMPONENTS STUFFED ON SOLDER SIDE OF PCB (C9,C12,C13,C16,C17,C33)

REV	DATE	DESCRIPTION
A	9-26-02	CREATED DRAWING
B	1-27-06	CHG'D R14, R15 TO 121k
C	1-30-06	CHG'D C26,C27,R21,R31 (VALUE CHG'S)

DRAFTER	APPROVED	ECN
KT	EJ	----
JTB		11387
JTB		11391



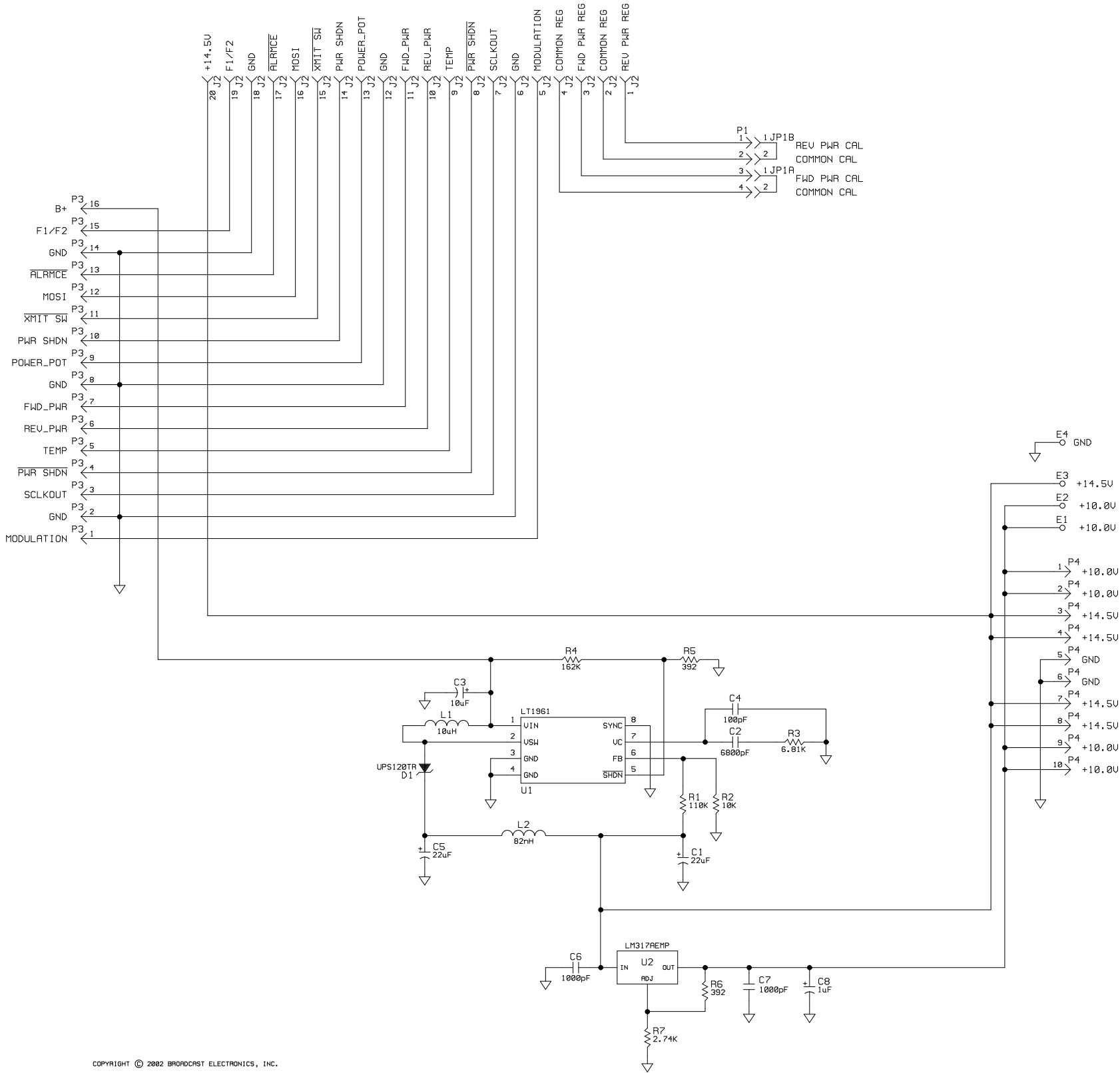
MARTI ELECTRONICS CLEBURNE, TX 76033-0661	DRAWING NO. COPYRIGHT <DATE>	800-285A20M REV C	TITLE STL-20M AUDIO PROCESSING BOARD
--	------------------------------------	----------------------	---



NOTES:

- 1) * INDICATES COMPONENTS STUFFED ON SOLDER SIDE OF PCB (C9,C12,C13,C16,C17,C33)

REVISIONS				
REV	DATE	DESCRIPTION	DRAFTER	ECN
1	11-20-02	PROTOTYPE RELEASE	KT	----
A	12-10-02	CHGD R7 TO 2.74K; ENGINEERING RELEASE	KT	EJ
B	12-13-02	CHGD E1-E4	KT	EJ
C	5-30-03	CHGD C1 & C5 FROM 100uF, 16U TO 22uF, 25U	KT	EJ

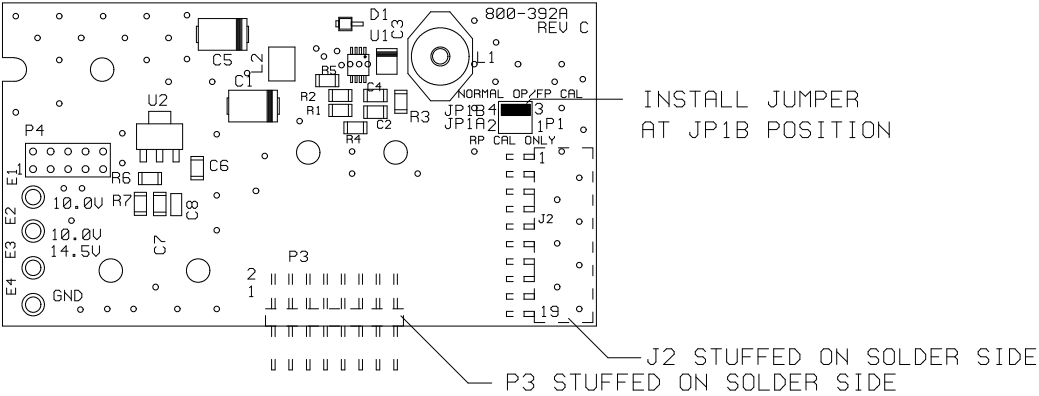


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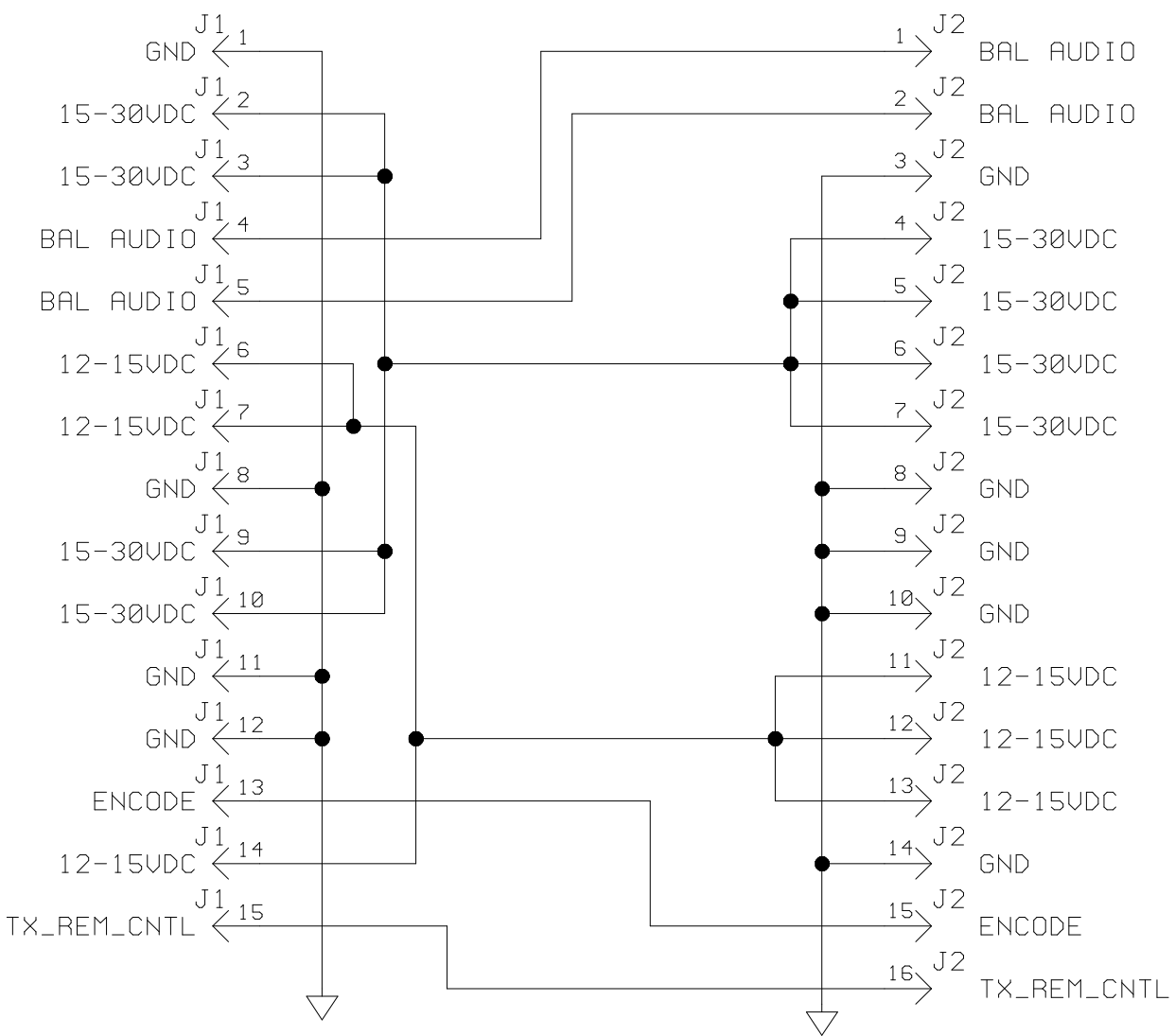
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	DESIGNER(S) ERIC JACKSON	FINISH	
TOLERANCE (DECIMAL) U.O.S. .x ± .030 .xxx ± .005 .xx ± .015 ANGLES ± 1°	PROJ. LEADER ERIC JACKSON	TYPE SIZE DWG. NO. S D 800-392A	REV C
	MFG.	NEXT ASSY.	MODEL SCALE SHEET 1 OF 1

REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	11-21-02	PROTOTYPE RELEASE	KT		----
A	12-10-02	CHGD R7; ENGINEERING RELEASE	KT	EJ	----
B	12-13-02	CHGD E1-E4 & FOOTPRINT FOR L2	KT	EJ	10860
C	5-30-03	CHGD C1 & C5 FROM 298-107-1 TO 070-2265-L25	KT		10986




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	DESIGNER(S) ERIC JACKSON	FINISH			
	PROJ. LEADER ERIC JACKSON	NEXT ASSY.	TITLE 14.5 VOLT STEP-UP REGULATOR		
	MFG.		TYPE A	SIZE B	DWG No. 800-392A REV C
TOLERANCE (DECIMAL) U.O.S. .X ± .030 .XXX ± .005 .XX ± .015 ANGLES + 1°			MODEL NNNN	SCALE 1/1	SHEET 1 OF 1



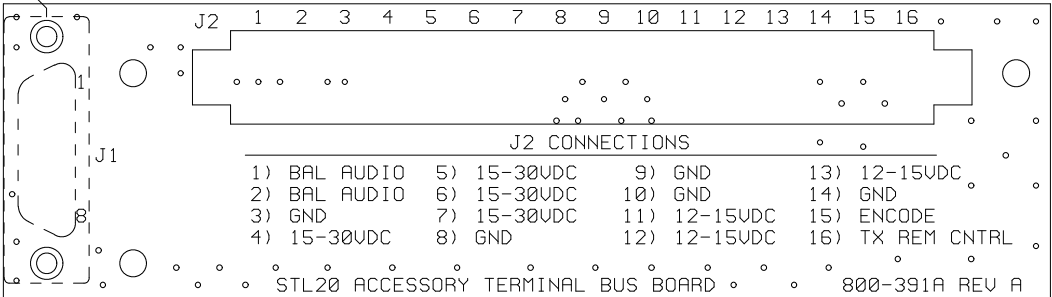
REVISIONS				
REV	DATE	DESCRIPTION	DRAFTER	APPROVED
1	11-5-02	PROTOTYPE RELEASE	KT	EJ
A	2-9-04	PRODUCTION RELEASE	KT	

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	DESIGNER(S)				
	PROJ. LEADER	FINISH	TITLE STL20 ACCESSORY TERMINAL BUS BOARD		
	MFG.	NEXT ASSY.	TYPE S	SIZE B	DWG. NO. 800-391A
TOLERANCE (DECIMAL) U.O.S. .x ± .030 .xxx ± .005 .xx ± .015 ANGLES ± 1°		MODEL NNN		SCALE NNN	SHEET 1 OF 1

REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	11-8-02	PROTOTYPE RELEASE	KT	EJ	-----
A	2-9-04	PRODUCTION RELEASE WITHOUT CHANGE	KT		-----

INSTALL J1 ON SOLDER SIDE



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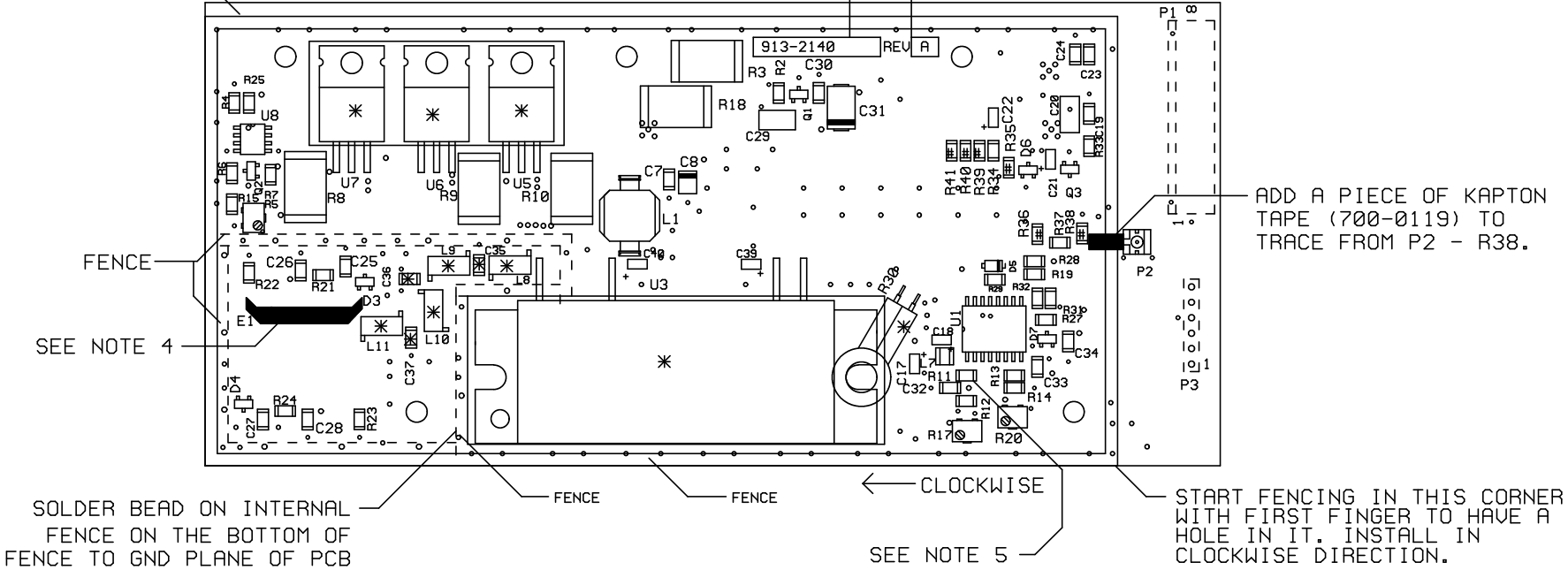
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	DESIGNER(S)				
	PROJ. LEADER	FINISH	TITLE STL20 ACCESSORY TERMINAL BUS BOARD		
	MFG.	NEXT ASSY.	TYPE A	SIZE B	DWG No. 800-391A REV A
TOLERANCE (DECIMAL) U.O.S. .X ± .030 .XXX ± .005 .XX ± .015 ANGLES + 1°		MODEL NNNN		SCALE 1/1	SHEET 1 OF 1

TABLE 1: UNIQUE FREQUENCY DEPENDENT PARTS				
FINAL BOARD ASSEMBLY	PA MODULE U3	FINAL LOW-PASS FILTER		
		L8 & L11	L9 & L10	C35,C36,C37
953-2140-156	468-760-002	350-200	350-201	270-180-1
953-2140-153	468-760-001	350-200	350-201	270-180-1
953-2140-233	468-760-003	350-202	350-200	270-120
953-2140-253	468-760-003	350-203	350-204	270-100-1
953-2140-333	468-760-004	350-205	350-203	270-608-1
953-2140-455	468-760-005	350-192	350-194	270-407-1
953-2140-453	468-760-006	350-192	350-194	270-407-1
953-2140-952	468-760-007	350-198	350-199	270-202

REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
A	6-25-04	ENGINEERING RELEASE	KWT		----

SOLDER BEAD AROUND OUTSIDE OF FENCE TO GROUND PLANE OF PCB


PLACE STICKER WITH FINAL ASSEMBLY NUMBER IN BOX
WRITE REV LEVEL IN BOX



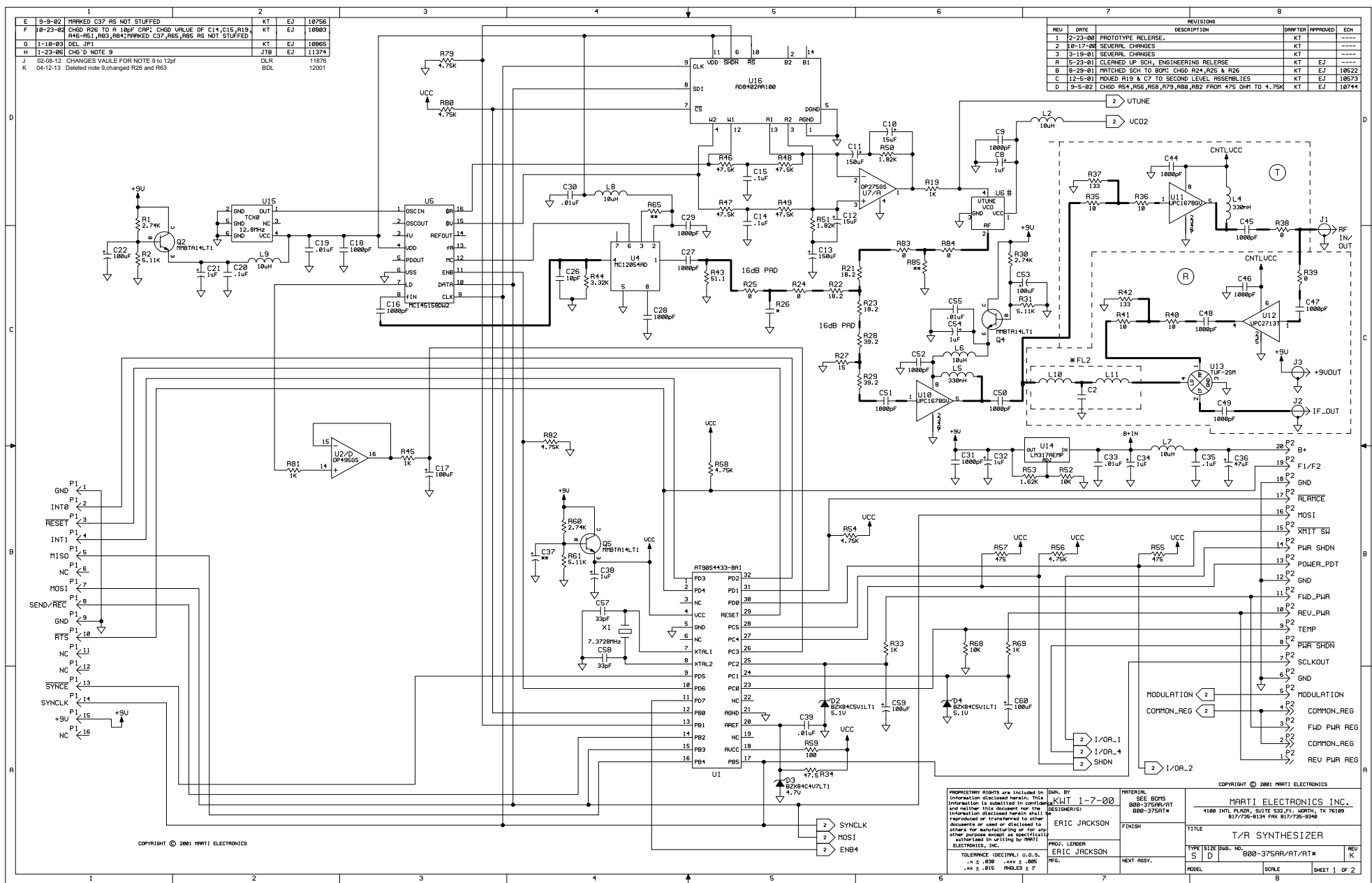
NOTES:

- 1) SEE SCHEMATIC: SB913-2140/953-2140-***
- 2) * INDICATES PARTS STUFFED DURING 953-2140-*** ASSEMBLIES (C35,C36,C37, L8-L11,R30,U3,U5-U7) SEE TABLE 1 FOR UNIQUE PARTS
- 3) # INDICATES PARTS NOT PLACED (R35,R36,R38-R41)
- 4) SOLDER TRACE CORNER TO CORNER ON ASSEMBLIES: 953-2140-153/156/233/253/333. REMOVE TRACE ON ASSEMBLIES: 953-2140-453, 953-2140-455/952.
- 5) REPLACE R11 WITH A 66.5K (101-6652) ON FINAL ASSEMBLIES 953-2140-153 & 953-2140-233.

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	DESIGNER(S)		TITLE RF PA BD ASSY, 2ND GEN PA MODULES			
	PROJ. LEADER TH	FINISH				
	TOLERANCE (DECIMAL) U.O.S. .X ± .030 .XXX ± .005 .XX ± .015 ANGLES + 1°	MFG.	NEXT ASSY.	TYPE A	SIZE B	DWG No. 913-2140/953-2140-***
			MODEL SRPT/STL		SCALE 1/1	SHEET 1 OF 1

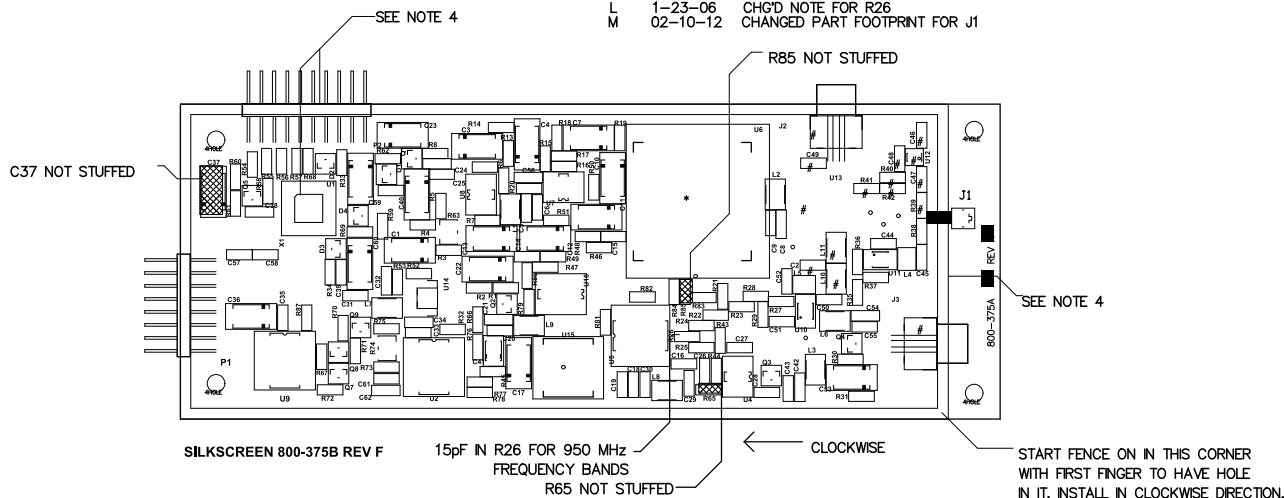
REVISIONS					
REV	DATE	DESCRIPTION	DRAWN	APPROVED	EDN
1	2-23-80	PROTOTYPE RELEASE.	K.T	-----	-----
2	10-17-82	SEVERAL CHANGES	K.T	-----	-----
3	3-19-81	SEVERAL CHANGES	K.T	-----	-----
4	5-23-81	CLEARED UP SCH. ENGINEERING RELEASE	K.T	EJ	-----
5	8-23-81	MATCHED SCH TO BOM: CHGD R24,R25 & R26	K.T	EJ	10522
6	12-5-81	MOVED R19 & C7 TO SECOND LEVEL ASSEMBLIES	K.T	EJ	10573
7	9-5-82	CHGD R54,R56,R58,R79,R80,R82 FROM 475 OHM TO 4.75K	K.T	EJ	10744



FINAL BOARD ASSEMBLY	U6	SOFTWARE	VER
800-375AT150	400-185	800-375ATSW2	2.0
800-375AT230	400-265	800-375ATSW2	2.0
800-375AT250	400-265	800-375ATSW2	2.0
800-375AT330	400-351	800-375ATSW2	2.0
800-375AT450	400-480	800-375ATSW2	2.0
800-375AT950	400-965	800-375ATSW2	2.0


TABLE 1

REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	2-23-00	PROTOTYPE RELEASE.	KT		
2	10-23-00	CHANGED LAYOUT	KT		
3	3-20-01	CHANGED LAYOUT	KT		
A	5-23-01	ENGINEERING RELEASE	KT		
B	8-29-01	MATCHED ASSEMBLY TO BOM: CHGD R24-R26	KT	EJ	10522
C	9-5-01	MOVED C7 & R19 TO SECOND LEVEL ASSEMBLIES	KT	EJ	10573
D	2-1-02	ADDED FENCE & KAPTON TAPE NOTES	KT	EJ	10620
E	4-3-02	ADDED SOFTWARE TABLE	KT	EJ	10668
F	9-5-02	CHGD R54,R56,R58,R79,R80,R82,R87 FROM 475 TO 4.75K	KT	EJ	10744
G	9-9-02	ADD NOTE INDICATING C37 IS NOT STUFFED	KT	EJ	10756
H	9-30-02	CHGD U15 TO A 012-280-1	KT	EJ	10790
J	10-23-02	CHGD SOFTWARE, C14,C15,R13,R14,R19,R24-R26,	KT	EJ	10803
K	1-10-03	R46-R51,R83,R84: CHGD NOTES & TABLE	KT	EJ	10865
L	1-23-06	DEL JP1	JTB	EJ	11374
M	02-10-12	CHGD NOTE FOR R26	DLR		11876
		CHANGED PART FOOTPRINT FOR J1			



NOTES:

- 1) P1 AND P2 ARE MOUNTED ON THE SOLDER SIDE OF PCB.
- 2) * INDICATES U6 IS STUFFED DURING FINAL BOARD ASSEMBLY
- 3) # INDICATES PARTS USED ON 800-375AR ASSEMBLY ONLY (C46-C49,C2,J2,J3, L10,L11,R39-R42,U12,U13)
- 4) INSTALL SOFTWARE DURING FINAL TEST PER TABLE 1. PUT A LABEL ON U1 & ON EXTERIOR OF FENCE ABOVE TO P2 INDICATING U1-V2.

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		DESIGNER(S) ERIC JACKSON			
TOLERANCE (DECIMAL) U.O.S. .X + .030 .XXX + .005 .XX + .015 ANGLES + 1		PROJ. LEADER ERIC JACKSON	FINISH	TITLE T/R SYNTHESIZER	
		MFG.	NEXT ASSY.	TYPE A	SIZE 1
				DWG No. 800-375AR/AT/AT*	REV M
				MODEL SRPT-40	SCALE 1/1
				SHEET 1	OF 1