TFT

MODEL 8300 SERIES

BROADCAST QUALITY AURAL STL

OPERATION MANUAL

P/N 5004-8300
REVISION H
DATE 3-15-88
EQUIPMENT SERIAL NO. TX 1150462 RX 1040261
SHIPMENT DATE SEP. 30 1988

TFT

MODEL 8300 SERIES

BROADCAST QUALITY AURAL STL

OPERATION MANUAL

TFT, INC.
3090 Oakmead Village Drive
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TEL (408) 727-7272 TWX 910-338-0584
FAX (408) 727-5942

TABLE OF CONTENTS

P/N 5004-8300
REVISION E
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T F T

MODEL 8300 SERIES STL SYSTEM

PART A

TFT, INC.
3090 Oakmead Village Drive
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SECTION A

Model 8300 Series STL System

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued) Page

SECTION A

GENERAL INFORMATION

A1.1 System Description

The TFT Model 8300 Studio Transmitter Link (STL) System provides a more reliable method than conventional telephone lines for transferring program material from a studio site to a station broadcast transmitter. The STL system makes it possible to transmit a composite FM stereo signal, consisting of a main and stereo signal, plus two subcarriers over only one link. The subcarriers can be used for secondary program material or remote control signals.

Excellent signal-to-noise ratio, low distortion, and high frequency stability are achieved in the 8300 Series Transmitters by the use of direct FM modulation and phase-locked loop (PLL) carrier frequency synthesis. To these qualities the 8300 Series Receivers add high signal selectivity, high gain with low noise, and a unique pulse-counting discriminator circuit which provides excellent phase-linear characteristics for better stereo separation and lower crosstalk than more conventional methods. All receivers are crystal fequency controlled superheterodyne units.

An optional Hot Standby system is available for both transmitter and receiver. These systems automatically switch to an alternate standby unit if the primary unit fails, assuring a secure and reliable link from studio to transmitter.

For a Hot Standby system, the Model 7770 Transmitter Automatic Switchover unit can be used with any of the STL transmitters, and the Model 7773 Receiver Automatic Switchover unit can be used with any of the receivers.

For further information regarding individual components in the system, refer to the following sections:

Section	B	8300 Transmitter
	C	7770 Auto Switchover (Transmitter)
	D	8301 Receiver
	E	7773 Auto Switchover (Receiver)

A1.2 Specifications

SYSTEM

Frequency Range ..... 940-960 MHz standard
Other frequencies available on request

Frequency Response	± .1 dB or better 30Hz to 53 kHz ± .3 dB or better 53 to 75 kHz
Distortion (THD & IMD)	0.2% or less 30 Hz to 53 kHz (typically less than 0.1% at 1 kHz)
Stereo Separation	50dB or better, 50 Hz to 15 kHz (typically 55 dB or better) 45 dB with narrow I.F.
Stereophonic Subchannel to Main Channel Crosstalk	50 dB or better
Main Channel to Stereophonic Subchannel Crosstalk	50 dB or better
Signal-to-Noise Ratio	75 dB or better below 100% modulation de-emphasized left or right

TRANSMITTER

RF Power Output	4 Watts minimum; 10 Watts to 14 Watts Maximum
RF Output Connector	Type N Female, 50 ohms
Deviation for 100% Modulation ..	±50 kHz
Frequency Stability	Better than .0001%, 0°C to 50°C
Spurious and Harmonic Emission..	60 dB or more below carrier level
Modulation Capability	One Stereo Composite Program and Two Subcarrier Channels
Modulation Inputs	Composite: 3.5V peak to peak, 10K ohms balanced and unbalanced, BNC and terminal strip. 1 and 2. Multiplex: 1.5V peak to peak, 10K ohms BNC, (2 each), frequency range 130 to 300 kHz
Power Source	115/230 VAC ±10%, 50/60 Hz, 80 Watts 24 VDC optional
Monitoring Capability	One 3 1/2" analog meter for monitoring power output, power supply, bias voltages, multiplex and program modulation. LED bargraph for monitoring 70 to 120% program channel modulation.

RECEIVER

RF Input Connector	Type N Female, 50 ohm
Sensitivity	40µV or less required for 60 dB SNR broadband, de-emphasized. 100µV or less required for 60 dB SNR left or right channel demodulated.

Selectivity (wide)	3 dB IF bandwidth ±200 kHz 60 dB IF bandwidth ±700 kHz 80 dB IF bandwidth ±1.2 MHz
Selectivity (narrow)	3 dB IF bandwidth ±150 kHz 60 dB IF bandwidth ±500 kHz 80 dB IF bandwidth ±1.2 MHz
Modulation Outputs	Composite: 3.5V peak-to-peak, 75 ohm balanced and unbalanced, BNC and clip lead. Multiplex: 1.5V peak-to-peak, 75 ohm BNC and terminal strip barrier.
Power Source	115/230 VAC ± 10%, 50/60 Hz, 10 watts, 24 VDC optional
Monitoring Capability	One 3-1/2" analog meter for monitoring power supplies, 0 to 120% modulation for program and multiplex channels. LED bargraph for monitoring input RF level and modulation 70 to 120%.

A1.3 Warranty

TFT, Inc. warrants each of the instruments of its manufacture to be produced to meet the specifications delivered to the BUYER; and to be free from defects in material and workmanship. TFT will repair or replace at its option, for a period of one year (two years for STL's) from the date of delivery of equipment, any parts that are defective from faulty material or workmanship.

Instruments found to be defective during the warranty period shall be returned to the factory with transportation charges prepaid by BUYER. It is with respect to any nonconforming equipment and parts thereof and shall be in lieu of any other remedy available by applicable law. All returns to the factory must be authorized by the SELLER, before such returns. Upon examination by the factory, if the instrument is found to be defective, the unit will be repaired and returned to the BUYER, with transportation charges prepaid by SELLER.

Transportation charges for instruments found to be defective within the first thirty (30) days of the warranty period will be paid both ways by the SELLER.

Transportation charges of warranty returns, wherein failure is found not to be the fault of the SELLER, will be paid both ways by the BUYER.

NO OTHER WARRANTY IS EXPRESSED OR IMPLIED. TFT IS NOT LIABLE FOR CONSEQUENTIAL DAMAGES.

A1.4 Claim for Damage in Shipment

Your instrument should be inspected and tested as soon as it is received. The instrument is insured for delivery. If the instrument is damaged in any way, file a claim with the carrier or, if insured separately, with the insurance company.

WE SINCERELY PLEDGE OUR IMMEDIATE AND FULLEST COOPERATION TO ALL USERS OF OUR PRECISION ELECTRONIC INSTRUMENTS.

PLEASE ADVISE US IF WE CAN ASSIST YOU IN ANY MANNER.

TFT, Inc.

3090 Oakmead Village Drive

Santa Clara, CA 95051

(408) 727-7272 TWX 910-338-0584

SECTION A2

INSTALLATION

A2.1 Unpacking and Inspection

Upon receiving the equipment, inspect the packing box and equipment for signs of possible shipping damage. Keep all packing material until performance is confirmed. If any of the equipment is damaged or missing, file a claim with the transportation company, or with the insurance company if insured separately.

A2.2 Preinstallation Checkout

Test the total system -- that is, the STL, the subcarrier generators, and demodulator -- on a back-to-back basis before installing the system in its final location. This is important to assure that all equipment interfaces properly before installation.

> **CAUTION**
>
> Do not connect the transmitter antenna output directly to the receiver antenna input. Doing so will destroy the receiver preamplifier.

For back-to-back testing, set the transmitter and receiver next to each other. Terminate the transmitter output in a 50-ohm load of appropriate wattage (see transmitter specifications in Section B1 of Part B of this manual). Place a wire approximately 12 inches long in the receiver antenna input. The receiver signal level, as indicated on the receiver meter, should be approximately 100% of full scale when the transmitter is turned on (step 8 of subsection A2.2.1).

To ensure that the transmitter and receiver function as a system, we recommend the following checkout plan before installation.

A2.2.1 Transmitter

> **CAUTION**
>
> The transmitter must be separated from any heat producing equipment by at least 1-3/4 inches of vertical rack space on top and bottom.

1. Place the RF POWER ON switch on the STANDBY position.

2. Set the Line Power Input switch-connector (located on the rear of the chassis) to the correct line voltage for available AC service (that is, 120V AC or 240V AC).

3. Connect the line cord to the AC power source. The SYSTEM UNLOCKED indicator should extinguish within 60 seconds after AC power is applied.

NOTE

Switches called out in steps 4 through 12 below are located on the front panel. Record the readings observed in these steps for future comparison when testing equipment.

4. Press the INT T P meter switch. The meter should indicate between 3.5 and 5.5 volts on the VOLT scale. The INT T P is factory set to read the VCO/Modulator Loop voltage.

5. Press the -12 VOLT meter switch. The meter should indicate bvetween 11 and 12.5 volts on the VOLT scale.

6. Place the RF POWER ON switch in the RF POWER ON position.

7. Press the FWD PWR meter switch. The meter should indicate approximately 12 watts on the WATT scale.

8. Press the REV PWR meter switch. The meter should indicate near 0 watts on the WATT scale.

9. Press the MUX 1 and then 2 meter switches. Without multiplex input signals, the meter should indicate 0 on the top scale in both positions.

10. Press the PRGM SIG meter switch. Without program input signals, the meter should indicate 0 on the top scale.

A2.2.2 Receiver

The receiver requires no preinstallation tests. Set the line power input switch-connector on the rear of the chassis for the correct line voltage for available AC service (that is, 120V AC or 240V AC).

A2.2.3 Transmitter Automatic Changeover (Optional)

The transmitter automatic changeover requires no pre-installation tests. Set the line power input switch-connector located on the rear of the chassis for the correct line voltage for available AC service (that is, 120V AC or 240V AC).

A2.2.4 Receiver Automatic Changeover (Optional)

No preinstallation testing is required.

A2.3 Installation and Connection

A2.3.1 Antenna Connections

The attenuation (RF loss) between the transmitter RF output and the receiver RF input are of prime importance and need careful attention. The transmitting and receiving antennas should be placed at heights that allow reasonable path clearance. Generally, vertical polarization is used; but either polarization may be used, provided both antennas have the same polarity.

To avoid damage to the transmission line -- one of the most common problems encountered during STL installation -- take care not to twist or bend the lines to ensure that they retain their characteristic impedance. A damaged line will cause poor system performance.

If the reverse power (as indicated on the transmitter meter) is high, the RF transmission line, the associated connectors, or the antenna may be at fault. After securing the connectors, have them treated to prevent exposure to moisture. A weatherproofing kit is recommended. Also, ground the line at various points as recommended for the particular cable selected.

For an STL antenna that is to be mounted on an AM antenna tower (which is typically insulated from ground), install an isocoupler where the line begins its run up the tower. This isocoupler will pass the STL signal efficiently while providing a high impedance to ground for the tower at the AM frequency.

More information on antenna installation and path loss can be found in TFT publication "Studio Transmitter Link Applications Guide."

The losses in the antenna transmission line (coaxial cable) used to interconnect the receiver or transmitter to its antenna must be determined and kept to a minimum. Where long runs of line are needed, proper STL performance requires the use of a low-loss coaxial cable, available from TFT.

For best performance, it is recommended that the TFT PTL-1 Accessory Kit with Connector Kit CON-1 or CON-2 (depending on antenna installed) be used for antenna feedlines. Each STL system requires two PTL-1 Accessory Kits and one CON-1 or one CON-2 Connector Kit. A PTL-1 kit consists of an N-type coaxial connector for installation assembly of FG-8/U coax. The CON-1 is a connector kit for LDF4-50 Heliax, and consists of two type L44N female connectors. The CON-2 connector kit is for LDF-50 Heliax, and contains two type L45N female connectors.

A2.3.2 Transmitter Audio and Multiplex Connections

The output of the stereo source is applied to the input of a pair of frequency selective audio limiters, as shown in Figure A2-1. The limited signals are then applied to a stereo generator, with a composite input of the transmitter. The "-" side of the balanced input must be tied to ground to operate in the composite mode. The transmitter is set to use multiplex channel 1 for the secondary program source with 0.53 V RMS equal to ±12 kHz deviation. Multiplex channel 2 is set for 0.53 V RMS equal to ±12 kHz deviation.

A2.3.3 Receiver Audio and Multiplex Connections

For a composite stereo system, the STL composite receiver at the remote site is connected as shown in Figure A2-4. The composite output from the receiver is connected directly to the wideband (composite) input of the FM exciter. The multiplex outputs are connected to their respective sub-carrier demodulators for secondary programming or remote control demodulation. The receiver program, multiplex 1, and multiplex 2 outputs can be taken from rear-panel multipin connector J5 or from the individual PGM (J2), MUX-1 (J3), and MUX-2 (J4) BNC connectors on the receiver rear panel.

A2.3.4 Transmitter Hot Standby Connections (Optional)

All necessary interconnecting control and RF cables are supplied with the optional Model 7770 Transmitter Automatic Changeover for connecting it to two STL transmitters. Refer to the Interconnecting Block Diagram, Figure A2-6.

Select which STL transmitter will be used as Transmitter No. 1 and which will be Transmitter No. 2. Connect one gray control cable from the Transmitter No. 1 rear-panel REMOTE connector to the Model 7770 rear-panel XMTR CTL 1 connector. The second gray control cable is then connected from the Transmitter No. 2 rear-panel REMOTE connector to the Model 7770 XMTR CTL 2 connector.

Using a flexible cable such a FG-214 (Hard-Line may damage the Automatic Changeover unit), connect the antenna feed line to the Model 7770 ANT connector.

Connect one of the two black coaxial cables from the Transmitter No. 1 RF POWER OUTPUT connector to the Model 7770 XMTR 1 connector. On Transmitter No. 2, connect the other black coaxial cable from TF POWER OUTPUT to the Model 7770 XMTR 2 connector.

The PROGRAM signal is a common input to both Transmitter No. 1 and Transmitter No. 2 COMP INPUT connectors. These BNC inputs are connected together by coaxial or shielded cable through a BNC tee, UG 274A (not supplied). Similarly, the MUX 1 input of Transmitter No. 1 is connected through a UG274A BNC tee to MUX 1 Of Transmitter No. 2 and MUX 2 through a tee to MUX 2.

A2.3.5 Receiver Hot Standby Connections (Optional)

All necessary interconnecting control and RF cables are supplied with the optional Model 7773 Receiver Automatic Changeover unit for connecting it to the two STL receivers. Make the connections shown in the Interconnecting Block Diagram, Figure A2-7. Audio and multiplex connections should be made in accordance with Figure A2-4 or Figure A2-5.

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
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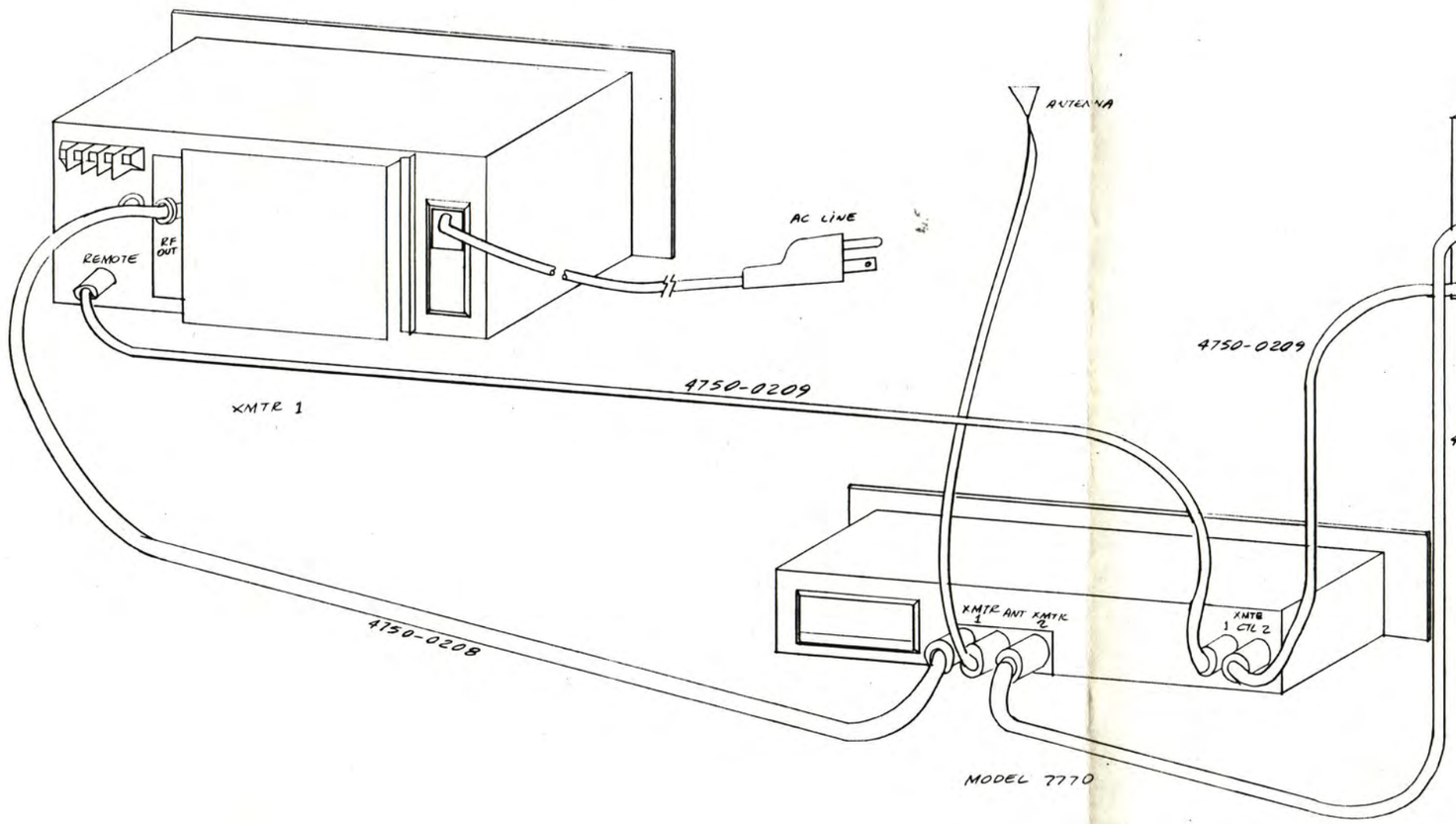
B	ADD CABLE P/N'S 4750-0208, 4750-0209	RRC	7/14/88	



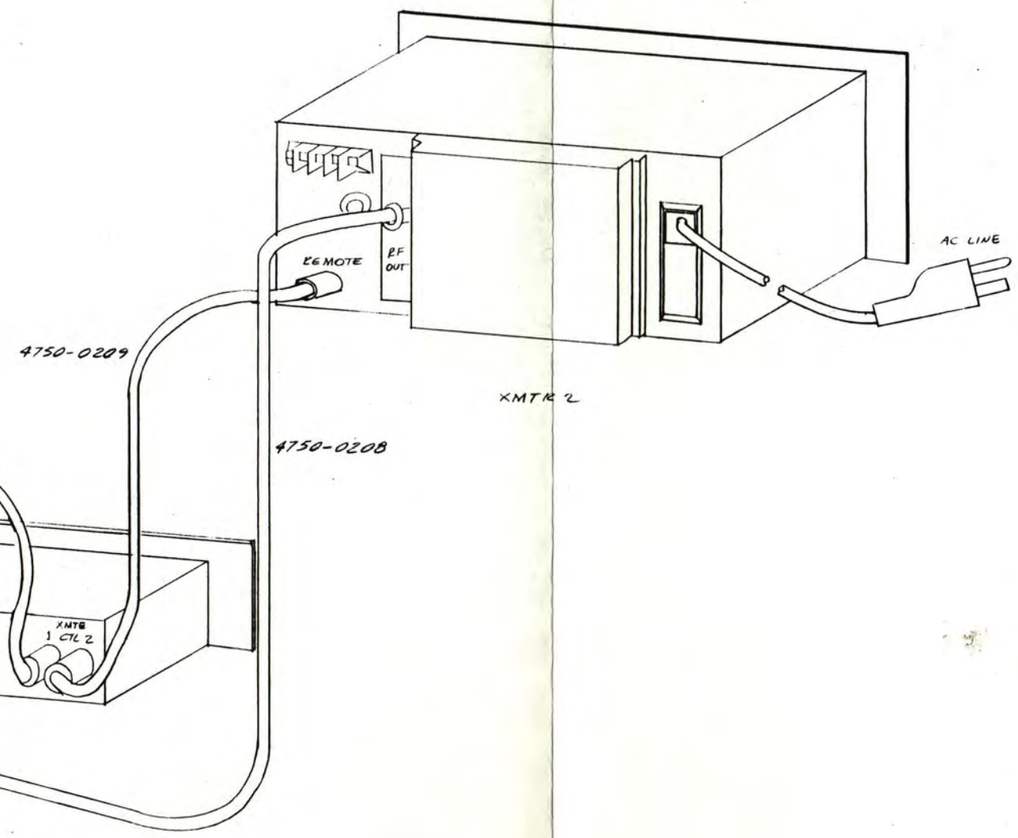


FIGURE A1

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
		MATERIAL	TFT INC. 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584
		FINISH	INSTALLATION DIAGRAM TRANSMITTERS FIGURE A1
		DR. BY L. Nuckles 6-29-88	
		CK. BY [illegible] 7/1/88	
		ENGR.	
		MFG [illegible] 7/1/88	
		Q.A. [illegible] 7/1/88	

MODEL	NEXT ASSY
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ±
DECIMAL = 2 PLACE ± 3 PLACE ±
BREAK = .010MIN
SURFACE ROUGHNESS = MICROINCHES RMS MAX
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = MAX
THREADS = CLASS 2 MARK IN ACCORDANCE WITH TFT SPEC 5300-1050

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	D	6600-2300	B
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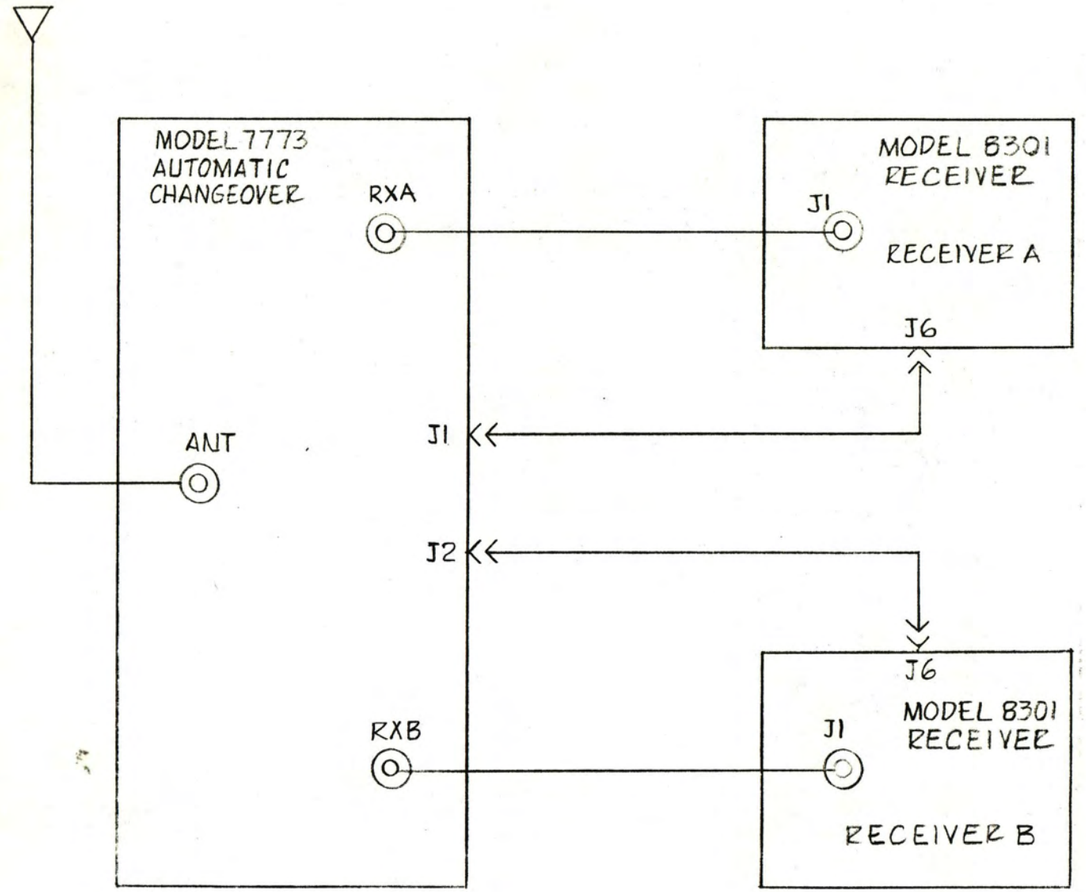


FIGURE A2

INSTALLATION DIAGRAM RECEIVER

SECTION A3

OPERATION

A3.1 General

This section explains the operation of the front-panel control on all of the system equipment (subsection A3.2). It also discusses the modulation level requirements for the transmitter (subsection A3.3).

NOTE

The transmitter and receiver are not equipped with AC power switches. Whenever the units are connected to an AC power source, the AC power is on.

A3.2 Controls, Connectors, and Indicators

A3.2.1 Transmitter Front Panel (Figure A3-1)

Reference	Name	Function
1	SYSTEM UNLOCKED LED	When lit, indicates a failure of the phase-locked loop (PLL) circuitry.
2	RF POWER ON Switch and LED	In the RF POWER ON position of the switch, all circuits are energized and the transmitter delivers power to the antenna. In the STANDBY position, power is removed from the Driver. The LED in the switch lights when the switch is in the RF POWER ON position.
3	REV PWR pushbutton switch	Selects RF power reflected from the antenna for monitoring on front-panel
4	FWR PWR pushbutton switch	Selects forward RF power to the antenna for monitoring on front-panel meter.
5	-12 SPLY	Selects the -12 volt supply to be monitored on the front panel meter.

Reference	Name	Function
6	INT T P	Selects the internal test point for monitoring on front panel meter. User selectable positions are: PA Supply Output VCO LOOP VOLTAGE Output VCO LEVEL 1 watt Driver Level Sample PLL LEVEL Sample PLL LOOP VOLTAGE VCO MOD LEVEL VCO MOD LOOP VOLTAGE From the factory they are set to monitor the VCO MOD LOOP VOLTAGE
7	MUX 2	Selects MUX 2 input signal for monitoring on front panel meter (100% = ±12 kHz deviation)
8	MUX 1	Selects the combined MUX 1 and input signal (100% = ±12 kHz deviation) for monitoring on front-panel meter.
9	PRGM SIG pushbutton switch	Selects incoming program signal (100% = ±50 kHz deviation) for monitoring on front-panel meter.
10	Meter	Indicates the voltage or signal level selected by the pushbuttons.
11	Bargraph Display	Displays 70% to 120% modulation on PRGM input.
12	RF PWR ADJUST	Adjusts power supply voltage to P.A. to vary RF Power Output.

A3.2.2 Transmitter Rear Panel (Figure A3-2)

Reference	Name	Function
1	BALANCED INPUT terminal strip	Provides input connections for balanced line. (Input impedance = 10K ohms).
2	MUX 1 INPUT connector	Provides input connection for telemetry or SCA. (Input impedance = 10K ohms).
3	MUX 2 INPUT connector	Provides input connection for telemetry or SCA. (Input impedance = 10K ohms).

Reference	Name	Function
4	COMP INPUT connector	Provides input connection for composite signal. When using this input, ground "-" terminal of BALANCED INPUT terminal strip.
5	REMOTE connector	Used to connect transmitter to Model 7773 Transmitter Automatic Changeover unit.
6	AC power connector	Connects transmitter to power source.
7	Fuse	Power line fuse SLO BLO (120V at 1A; 240V at 1/2A) for Model 8300.
8	RF POWER OUT connector	Provides RF output to antenna. Type N female connector. Output impedance = 50 ohms.

A3.2.3 Receiver Front Panel (Figure A3-3)

Reference	Name	Function
1	+12V pushbutton switch	Selects ±12V output of power supply for monitoring on front-panel meter.
2	-12V pushbutton switch	Selects -12V output of power supply for monitoring on front-panel meter.
3	+5V pushbutton switch	Selects +5V output of power supply for monitoring on front-panel meter.
4	PGM pushbutton switch	Selects program audio for monitoring on front-panel meter.
5	MUX-1 pushbutton switch	Selects the MUX-1 signal for monitoring on front-panel meter.
6	MUX-2 pushbutton switch	Selects the MUX-2 signal for monitoring on front-panel meter.
7	Meter	Indicates the voltage or signal level selected by the pushbuttons.
8	Bargraph Display	Indicates modulation levels between 70 and 100%.

Reference	Name	Function
9	RF Level Display	Indicates relative RF level of input signal.
10	Narrow/Wide IF switch	Selects IF Bandwidth.
11	Hi/Lo Gain	Switches a 10dB attn into amp for hi RF level environment.

A3.2.4 Receiver Rear Panel (Figure D3-4)

Reference	Name	Function
1	ANT INPUT connector J1	Used to connect cable from antenna if single receiver is being used; used to connect cable from Receiver Automatic Changeover unit if Hot Standby system is being used.
2	PGM connector J2 (BNC)	Provides main program channel audio output.
3	MUX-1 connector J3 (BNC)	Provides secondary program subcarrier output.
4	MUX-2 connector J4 (BNC)	Provides control subcarrier output.
5	AUDIO INPUT/OUTPUT connector J5	Provides same program and multiplex outputs as J2, J3, and J4. Also provides AGC and -PGM for balanced output.
6	AUTO CHANGEOVER 7773 connector J6	Provides +12V, -12V, and squelch for monitoring by the Receiver Automatic Changeover unit. Also brings in control signal from Receiver Automatic Changeover unit.
7	Fuse	Power line fuse SLO BLO (120V at 1/4A; 240V at 1/8A).
8	Chassis GND	

A3.2.5 Transmitter Automatic Changeover Unit Front Panel (Figure A3-5)

Reference	Name	Function
1	XMTR TEST 1 pushbutton switch	Tests the automatic changeover function and Transmitter No. 1.
2	XMTR TEST 2 pushbutton switch	Tests the automatic changeover function and Transmitter No. 2.
3	XMTR ON 1 pushbutton switch	Locks Transmitter No. 1 in the transmit mode.
4	XMTR ON 2 pushbutton switch	Locks Transmitter No. 2 in the transmit mode.
5	AUTO pushbutton switch	Puts the Transmitter Automatic Changeover unit in the automatic mode.
6	XMTR 1 RADIATE LED	Indicate that Transmitter No. 1 is radiating.
7	XMTR 2 RADIATE LED	Indicates that Transmitter No. 2 is radiating.
8	AC POWER LED	Indicates that AC line power is on.

A3.2.6 Transmitter Automatic Changeover Unit Rear Panel (Figure A3-6)

Reference	Name	Function
1	Power line cord	Supplies 120/240V AC line power.
2	Fuse	1/2A, 120V AC; 1/4A, 240V AC.
3	XMTR 1 connector	Used to connect RF input from Transmitter No. 1.
4	ANT connector	Provides RF output to antenna.
5	XMTR 2 connector	Used to connect RF input from Transmitter No. 2
6	STATUS terminal strip	Provides output for controlling external alarm; 50V, 250 mA maximum.
7	XMTR CTL 1 connector	Provides input and output control signals to Transmitter No. 1

Reference	Name	Function
8	XMTR CTL 2 connector	Provides input and output control signals to Transmitter No. 2.

A3.2.7 Receiver Automatic Changeover Unit Front Panel (Figure A3-7

Reference	Name	Function
1	RxA lamp	This green LED lights when Receiver A is delivering the audio output to the station transmitter.
2	Rotary switch	In the RXA position, this switch selects Receiver A to provide the audio output to the station transmitter, unless Receiver A's power supply is inoperative, in which case Receiver B will provide the audio output. In the AUTO position, the receiver previously selected manually will supply the audio output; but the other receiver will be automatically selected if the RF signal level or power supply voltages fail in the manually selected receiver. In the RXB position, Receiver B will be manually selected with the same exception cited above for the RXA position.
3	RxB lamp	This green LED lights when Receiver B is delivering the audio output to the station transmitter.

A3.2.8 Receiver Automatic Changeover Unit Rear Panel (Figure A3-8)

Reference	Name	Function
1	RXA multipin connector	Used to connect the Receiver Automatic Changeover unit to Receiver A.
2	RXB multipin connector	Used to connect the Receiver Automatic Changeover unit to Receiver B.
3	ANT connector	Connects the Receiver Automatic Changeover unit to the antenna.
4	RXB connector (BNC)	Connects the antenna to Receiver B.

Reference	Name	Function
5	RXA connector (BNC)	Connects the antenna to Receiver A.

A3.3 Transmitter Modulation Operating Levels

A3.3.1 Composite

The level required to modulate the composite input on a composite transmitter is 1.24V RMS (3.5V p-p) into 10K ohms unbalanced. The audio inputs of the stereo generator should be limited using a frequency selective limiter, to be set up according to manufacturer's specification.

A3.3.2 Subcarrier

The two multiplex inputs on the 8300 Series Transmitters are provided for secondary programming and control subcarriers' input (injection). The program material and/or control tones are applied to the input of the subcarrier generator or generators at the studio. The output from the subcarrier generator or generators is applied to the multiplex input of the transmitter. The input sensitivity is factory calibrated for ±12 kHz (100% modulation on meter) subcarrier frequency deviation. It requires 0.5 vrms to produce 100% modulation. If two multiplex signals are used, each signal should be calibrated to read 50% on the front panel meter by adjusting the output level of the generator.

The multiplex carriers from the transmitter for demodulation are filtered out from the program signals. If two carriers are used, they will come out simultaneously from the 140 - 220 kHz band pass filter. The subcarrier demod must be equipped with additional band pass filters to separate the two carriers.

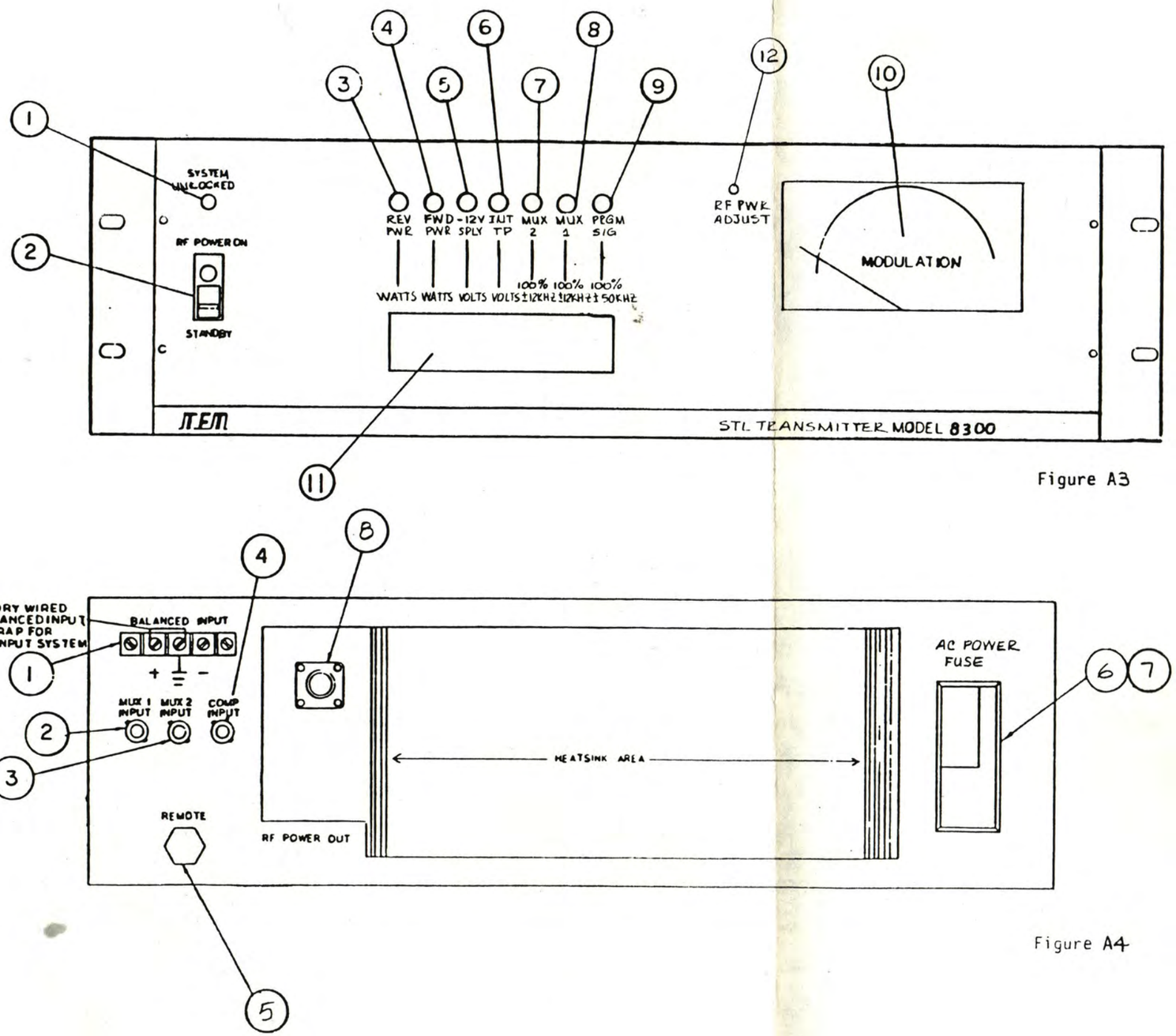


Figure A3

Figure A4

Fig. A3 Front Panel 8300 Transmitter

Fig. A4 Rear Panel 8300 Transmitter

DWG. NO.	SH	REV.
		A

REVISIONS

REV.	DESCRIPTION	DATE	APPROVED

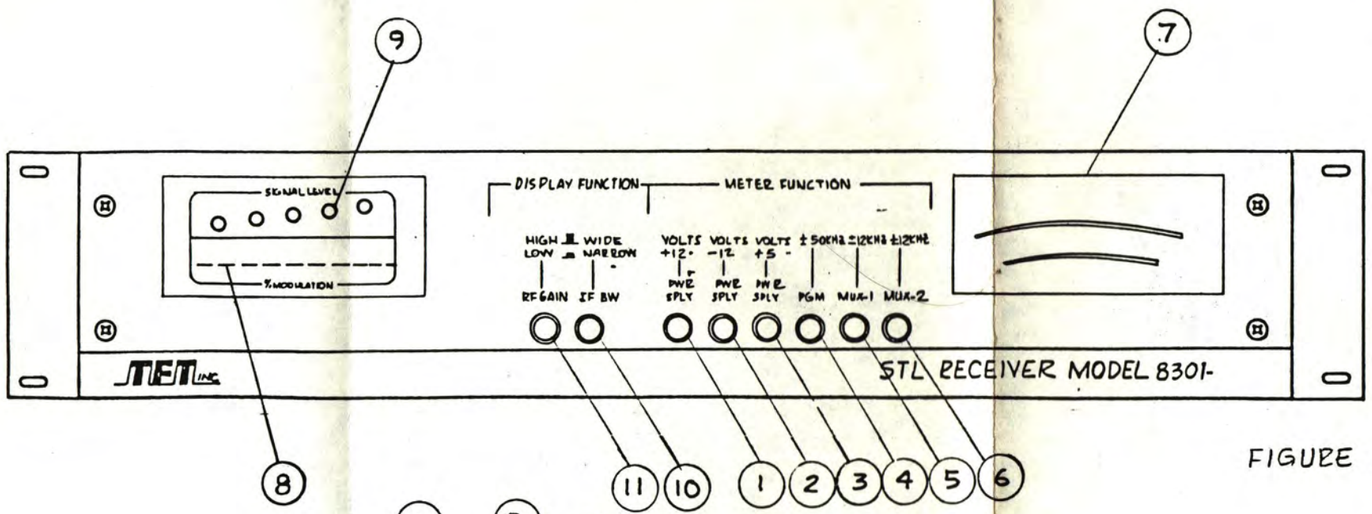


FIGURE A5

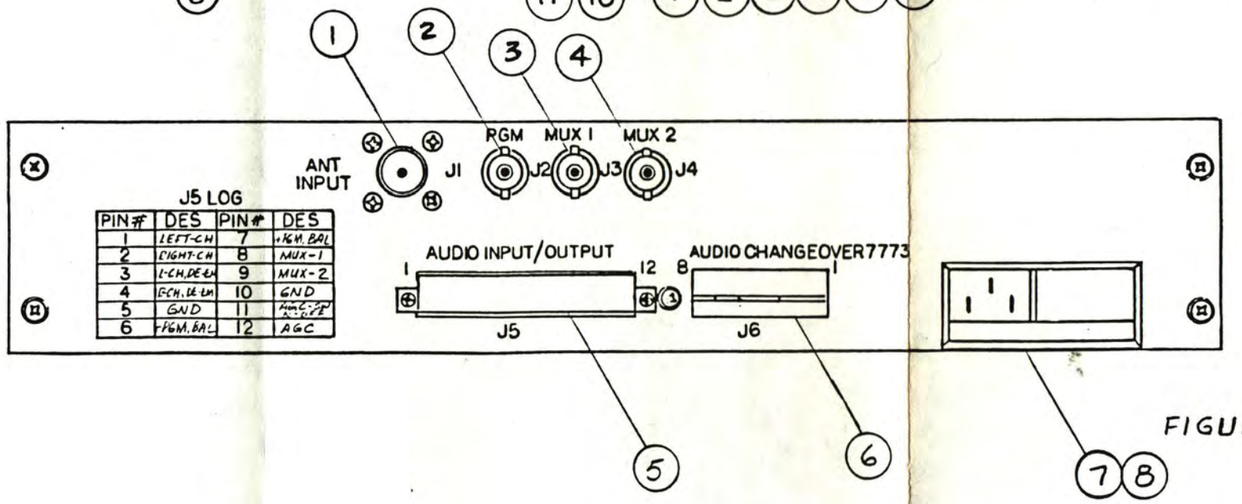


FIGURE A6

FIGURE A5. FRONT PANEL MODEL 8301 RECEIVER
FIGURE A6 REAR PANEL MODEL 8301 RECEIVER

	QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	

PARTS LIST

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN	
CHECKED	
ISSUED	

MET TIME & FREQUENCY TECHNOLOGY INC.

SIZE	FSCM NO.	DWG. NO.	REV.
B			

SCALE | SHEET

Figure A7

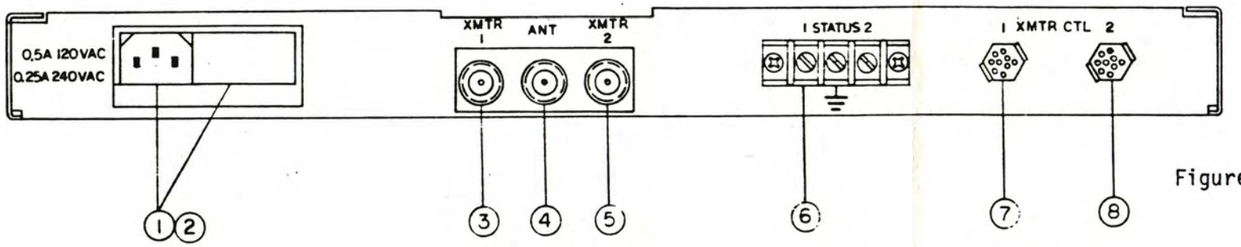


Figure A8

Fig. A7 Front Panel Model 7770

Fig. A8 Rear Panel Model 7770

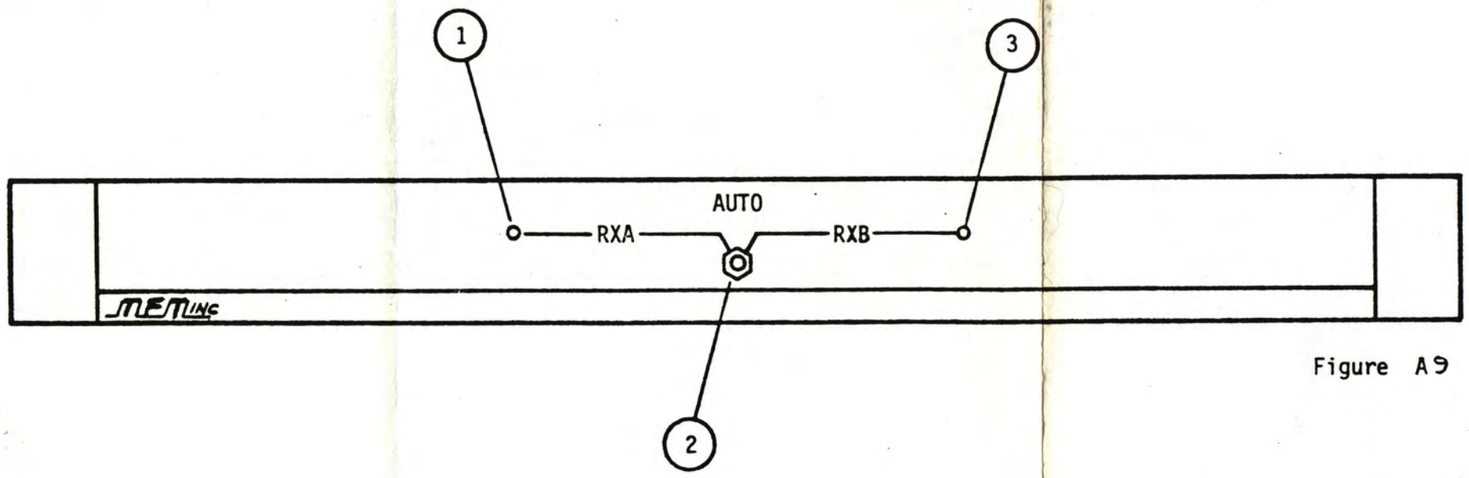


Figure A9

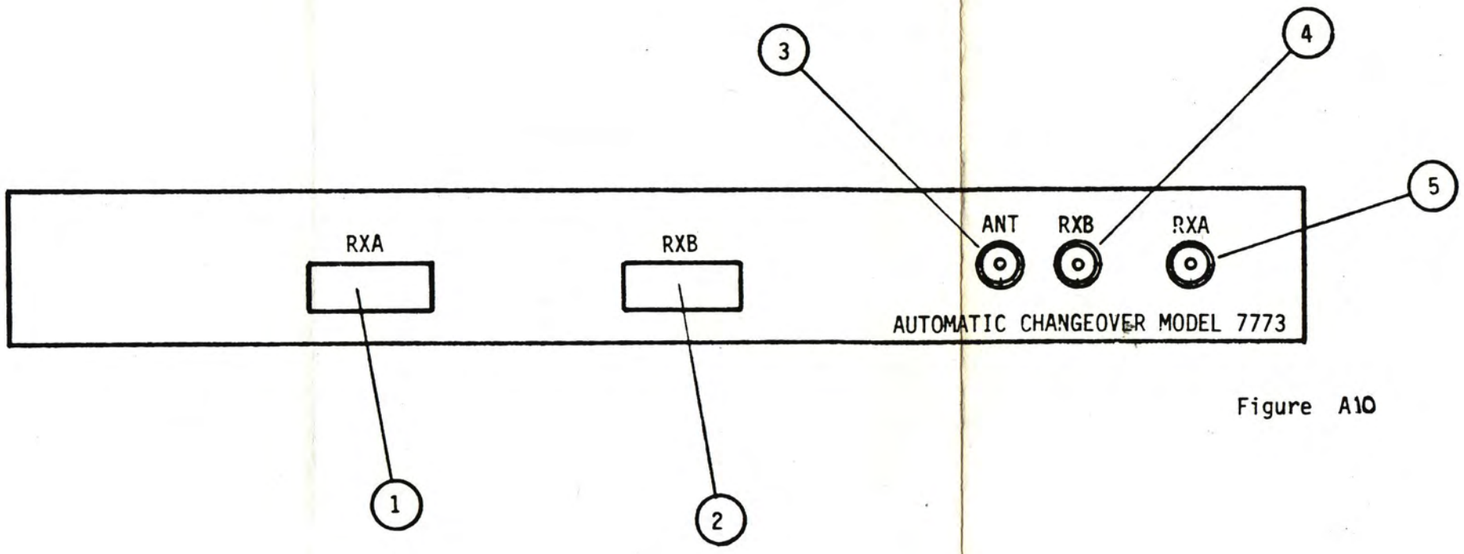


Figure A10

Fig. A9 Front Panel Model 7773

Fig. A10 Rear Panel Model 7773

SECTION A4

SYSTEM MAINTENANCE

A4.1 General

Once installed, the TFT Series 8300 Studio Transmitter Link should require little maintenance. The units should be installed away from vacuum tubes and other heat generating equipment, and the STL Transmitter should be provided with adequate ventilation for its rear-panel heat sink.

A4.2 Access

Circuit assemblies and top-of-chassis components in all STL units are accessible by removing the top cover of the unit.

A4.3 Periodic Maintenance

Once the STL is installed, the only maintenance necessary is a periodic proof of performance check of the system to be assured of optimum operation.

The performance of the STL Transmitter and Receiver units can be easily and quickly checked at the front panel meter. Following installation of the STL system, the meter readings for each position of the meter selector switch should be recorded. This gives a quick and accurate check of system performance by allowing a comparison of operation at a later date to its operation when new. Gradually changing readings can be quickly spotted by this method, and used to forestall developing problems.

When comparing receiver data, consideration must be given to environmental conditions at the time of the reading. Weather conditions or a temperature inversion could cause transmission path fade margins to be reduced, and meter readings might not be indicative of true system performance.

SECTION A5

ALIGNMENT PROCEDURES

A5 Introduction

This section presents the alignment procedures for the 8300 System and a list of recommended test equipment. Also included are descriptions of all module adjustments, general troubleshooting information, and test fixture diagrams. Relevant troubleshooting information is included at the end of each alignment procedure.

A5.1 Test Equipment

Table A5-1.1 lists the test equipment recommended for use in the alignment procedures. Equivalent items of test equipment may also be used.

A5.2 Alignment Procedures

The 8300 alignment procedures include the following:

1. STL frequency alignment.
2. Receiver sensitivity
3. Transmitter deviation, and receiver output level calibration.
4. Ultimate signal-to-noise ratio.
5. Distortion alignment.
6. Stereo separation, and signal-to-noise ratio.
7. Stereo crosstalk.

TABLE A5-1.1 Recommeded test equipment

Instrument Type	Suggested Model	Critical Specification
COUNTER	Tektronix DC-508A 1.3 GHz Counter	Single Link ±5 ppm
	Note: For dual links on same frequency, include Option 01.	Dual Link ±.2 ppm
DIRECTIONAL COUPLER	Microlab/FXR Model CB-49B	30 dB 1.0 - 2.0 GHz
ATTENUATOR, 50-OHM LOAD	Philco 662A-30 or Sierra 661-A-30	50 ohms 30 dB
ATTENUATOR, ADJUSTABLE	Kay Elemetrics Model 432D	50 ohms 1,2,3,5,10 & 20 dB steps
RF SIGNAL GENERATOR	Hewlett-Packard Model 8640B with Option 01 & 02	Freq. Range: .5 MHz to 1024 MHz Residual FM: <30 Hz, 20 Hz to 15 kHz <10 Hz, 300 Hz to 3 kHz Output Level Accuracy: +3.5 dB -7 to -47 dB ∓4.0 dB -47 to -137 dB Output Impedance: 50 ohms FM Deviation Bandwidth: dc to 250 kHz
DISTORTION MEASUREMENT SET	Hewlett-Packard Model 339A or Tektronix AA501 with SG505 and TM503 Main Frame	Distortion Measurement Residual Noise: (80 kHz) -92 dB Input Impedance: 100 k ohms shunted by <100 pF Voltmeter Accuracy: 20 Hz to 20 kHz ±2% 10 Hz to 110 kHz ∓±4% Oscillator Frequency Range: 10 Hz to 110 kHz Output Level: >3 V rms into 600 ohms Distortion: 10 Hz to 20 kHz <-95 dB (.00187)THD
AUDIO OSCILLATOR	Hewlett-Packard 204C	600 ohm output frequency range 100 kHz to 200 kHz
RF SPECTRUM ANALYZER	Hewlett-Packard Model 8559A with 181T display	Frequency Band: .01-3 GHz Dynamic Range: .01 to 3 GHz >70 dB Display Range: Log 10 dB/div and 1 dB/div Display Accuracy Log: less than 2 dB over full range Input Impedance: 50 ohms SWR: <1.3 dB ≥10 dB input attenuation

Instrument Type	Suggested Model	Critical Specification
AUDIO SPECTRUM ANALYZER	Tektronix Model 7L5 with Option 25 and L3 Plug-in 7603 Main Frame	Input Impedance: 1M ohms/28 pf Input Frequency: 10 Hz to <500 kHz Display Range: 80 dB, log 10 dB/div
POWER METER AND SENSOR	Hewlett-Packard Model 435A with Model 8481A Power Sensor	Accuracy: ±1% of full scale Power Range: -25 dBm (100 mW) full scale
STEREO GENERATOR	C.N. Rood Model 203	Stereo SNR: 75 dB Separation: 55 dB THD: 0.1% or less
STEREO DEMODULATOR	TFT 724A	Stereo SNR: 75 dB Separation: 55 dB THD: 0.5% or less
OSCILLOSCOPE	Tektronix Model 465	Bandwidth: 75 MHz
MULTIMETER	Data Precision Model 238	
75 μs DE-EMPHASIS NETWORK	Figure A5-2	

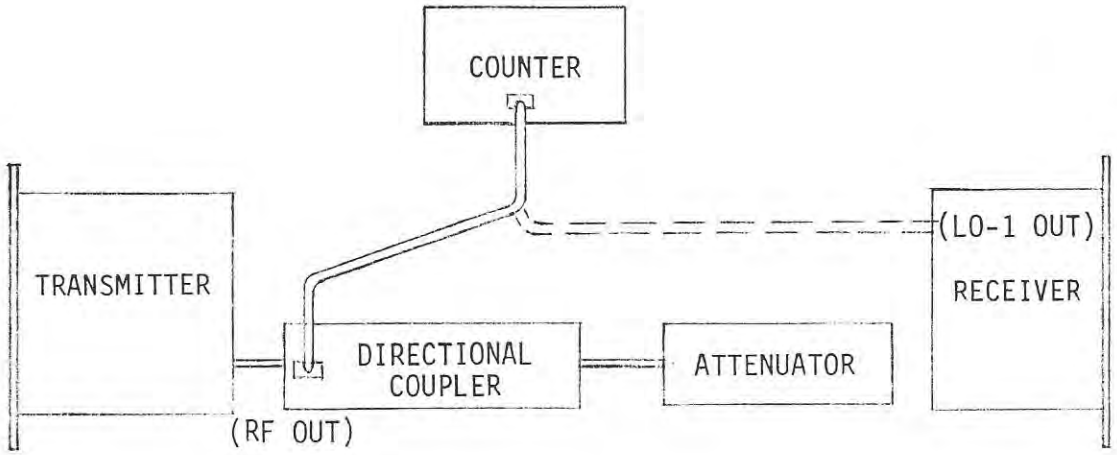
A5.2.1 STL Frequency Alignment

Specifications

±.0001%, 0° to 50° C (450 Hz at 950 MHz)
±500 Hz at 25° C (77° F)

Description

The STL: frequency is aligned by using a counter to measure the transmitter ouput frequency and the receiver first local oscillator frequency. A high-precision counter (±0.2 ppm) is recommended to align STL links that are used in a redundant installation. If such a counter is not available, we recommend that both STL systems be aligned at the same time using the the same counter. A difference greater than 2 kHz between the STL transmitter center frequency and receiver center frequency will result in degradation of the distortion, separation, and crosstalk performance.



CAUTION: Place the transmitter RF POWER switch in STANDBY until the coupler and attenuator are connected.

Figure A5-1. Test setup for frequency alignment.

Test Equipment

Name	Maufacturer	Model
Counter	Tektronix	EC-508A with Option 01
Directional Coupler	Microlab	FXR CB-49N
Attenuator, Load	Philco	662A-30

Procedure

1. Connect the equipment as shown in Figure A5-1.
2. Position the transmitter RF POWER switch to the ON position. Using the METER FUNCTION switch, select the FWD POWER position. Verify that the front panel meter reads between 10 and 14 watts on the watts scale.
3. Check the serial number label on the back of the STL transmitter for its operating center frequency. The counter should indicate the frequency within 2 kHz of the specified center frequency. If it does not, proceed to the troubleshooting portion of this procedure and verify that the Sampling Phase Lock Loop and VCO/Modulator are operating at their specified frequencies.
4. While monitoring the counter, adjust the transmitter First LO frequency adjustment for a reading of the specified transmitter frequency $\pm$200 Hz.
5. Calculate the receiver First LO frequency by subtracting 63 MHz from the frequency specified on the serial number label at the back of the 8301 Receiver.
6. Connect a frequency counter to the output of the receiver First LO. The counter should indicate a frequency within $\pm$2 kHz of the frequency calculated in Step 5. If it does not, proceed to the troubleshooting portion of this procedure.
7. Using the counter, adjust the reciever First LO frequency adjustment for a reading within $\pm$200 Hz of the frequency calculated in Step 5.

Note: If two STL systmes are installed for redundant operation, both should be aligned for frequency at the same time.

Troubleshooting

1. The crystal in the transmitter Sampling Phase Lock Loop should be 87.650 MHz.
2. The crystal frequency of the Reciever First LO should be

$$\frac{Fr_{MHz} - 63MHz}{10}$$

3. If the First LO fails to meet the ±2 kHz specified in this procedure, the crystal oven should be checked to ensure that it is operating at 70° C ±5° C.
4. If the transmitter frequency fails to meet the ±2 kHz specified in this procedure and the sampling P.L.L. appears to be operating to specification, the VCO/Modulator should be checked to ensure that it is operating at its designed frequency. The VCO/Mod frequency may be calculated as follows:

   VCO/Mod frequency = The transmitter center frequency minus 876.5 MHz.

   The VCO/Mod frequency should be within ±500 kHz of the value calculted.

A5.2.2 Receiver Sensitivity

Specification:

30 uV, or less, for 60 dB SNR broadband, de-emphasized

150 uV, or less, for 60 dB SNR left or right channel demodulated stereo, de-emphasized

Description:

The sensitivity of the 8301 STL Receiver is verified using a signal generator and a de-emphasis network or a de-emphasized stereo demodulator.

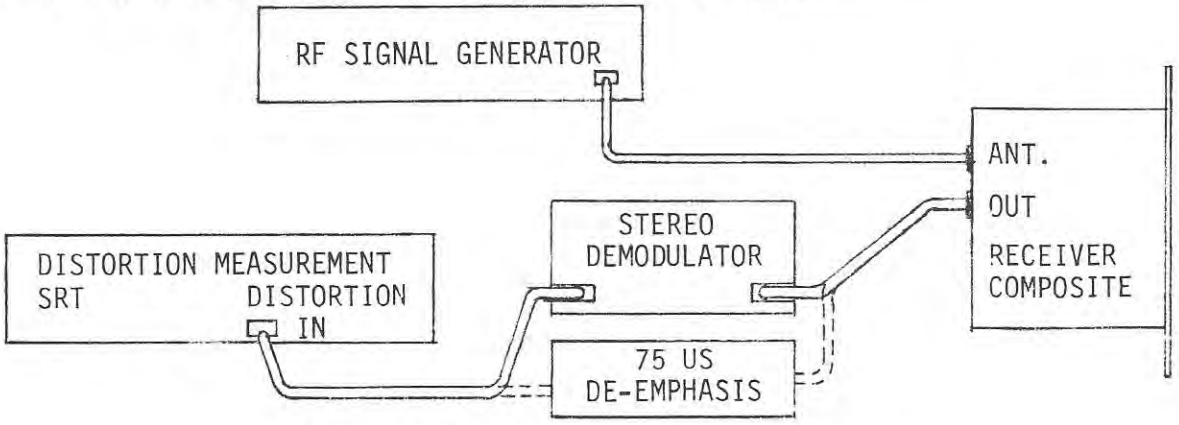


Figure A5-2. Sensitivity test setup.

Test Equipment:

Name	Manufacturer	Model
RF Signal Generator	Hewlett-Packard	HP-8640B
75 Us De-emphasis Network	(See Figure A5-2)	
Stereo Demodulator	TFT	Model 724A
Distortion Measurement Set	Hewlett-Packard	HP-339A

Procedure:

1. Connect the equipment as shown in Figure A5-2, and set the controls on the signal generator as follows:

Meter Level	Volts
AM Modulation	Off
FM Deviation	Off
Range MHz	1024/512
Frequency Tuned	Tuned to frequency indicated on serial number label on back of STL receiver.
Output Level	-40
RF	On

Adjust the output level on the signal generator for a reading of 3 mV on the signal generator meter.
Using the RF Level LEDS on the 8301 Receiver, verify that the meter reads 3 mV.
While monitoring the RF Level LEDS of the receiver, switch the OUTPUT LEVEL ADJ on the signal generator from -40 to -110 and verify that the signal strength reads within the meter range for each setting. If it does not, proceed to paragraph A4.4.4, 63 MHz to 850 kHz, prior to continuing the test, and perform the calibration adjustments given there.

4. Using the METER FUNCTION switch on the receiver, select the PGM LEVEL position.

   Set the FM Deviation on the RF signal generator to ON.

   Set the modulation frequency on the signal generator to 400 Hz.

   Adjust the deviation control on the signal gerator so that the meter of the STL receiver reads 0 dB on the top scale. Verify that the deviation on the signal generator reads ±50 KHz.

5. Set the controls on the distortion measurement set for a 0 dB reference.

   Set the FM Deviation on the RF signal generator to OFF.

   Position the controls on the distortion measurement set for a reading of 60 dB SNR.

   Reduce the RF LEVEL adjustment on the RF signal generator until the distortion measurement set reads 60 dB.

   Observe the RF level output of the signal generator; it should indicate less than 150 uV.

6. Set the controls on the distortion measurement set for a signal-to-noise ratio of 40 dB.

   Reduce the RF level on the signal generator until the mute threshold is reached. Observe the RF level output of the signal generator; it should indicate less than 22 uV. Then set the RF level output of the signal generator to 30 uV and adjust the MUTE THRESHOLD ADJ until the mute threshold pot for muting.

   Note: This completes the testing for sensitivity if the STL receiver is used in a composite link.

7. Broadband De-emphasized SNR

   Replace the stereo demodulator with a 75 Us de-emphasis network. (see Figure A8-16.) Repeat the above steps 1 through 6 with the following exception:

   The specification for 60 dB signal-to-noise ratio is 30 uV, or less.

Troubleshooting:

1. The cable between the RF signal generator and the STL receiver should be kept at a minimum to reduce insertion loss. As an example, a 3-foot cable (RG-58) will cause a 1 dB or 10% loss in signal.
2. Prior to troubleshooting, verify that the RF GAIN SWITCH on 8301 Front Panel is in the out position.
3. Verify the RF gain distribution of the 8301 Receiver on the schematic diagrams.

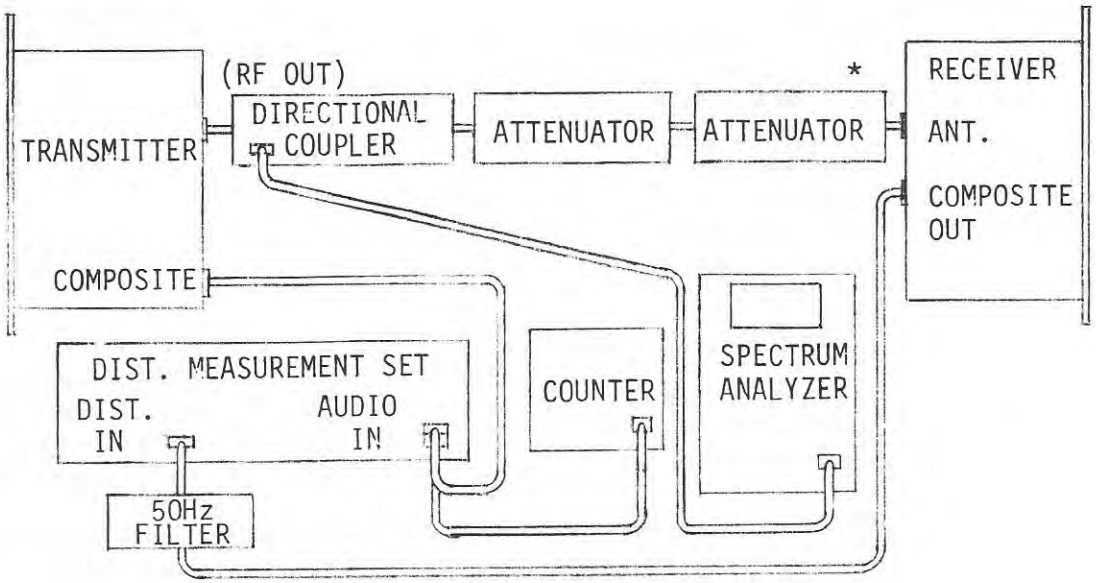
A5.2.3 Transmitter Deviation, and Receiver Output Level Calibration

Specification:

Transmitter:	1.24 Vrms composite input equals ±50 kHz deviation. .54 Vrms MUX 1 equals ±12 kHz deviation. .54 Vrms MUX 2 equals ±12 kHz deviation.
Receiver:	Composite output equals 1.24 Vrms with 50 kHz deviation (30 Hz - 75 kHz). MUX output equals .54 Vrms for ±12 kHz deviation (130 kHz - 190 kHz).

Description

The deviation and modulation sensitivity of the composite information is aligned using a Bessel null function as a reference. The MUX channel is aligned using an RF generator as a reference.



CAUTION: Place the transmitter RF Power switch in STANDBY until the coupler and attenuator are connected.

*CAUTION: To avoid receiver damage, initially set attenuator for maximum attenuation.

Figure A5-3. Test setup for deviation alignment.

Test Equipment

Counter	Tektronix DC-508A
Directional Coupler	Microlab FXR CB49N
Attenuator, 50 ohm Load	Philco 662A-30
Attenuator, Adjustable	Kay Elemetrics 432D
RF Signal Generator	HP-8640B
Distortion Measurement Set	HP-339A
Audio Oscillator	HP-204C
Spectrum Analyzer	HP-8559A
50 Hz Filter	(See Figure A4-15)
Oscilloscope	Tektronix T932A

Procedure

1. Connect the equipment as shown in Figure A5-3.
2. Adjust the audio oscillator of the distortion measurement set for an output voltage of 1.24 Vrms at 20.79 kHz as follows:
   a. Position the meter function switch to the oscillator level position and adjust the oscillator level controls for a reading of 1.24 Vrms on the meter.
   b. Using the counter to monitor the oscillator frequency, position the frequency controls for a reading of 20.79 kHz.
3. Position the STL trasmitter RF Power switch to the ON position. Using the METER FUNCTION switch, select the FWD POWER position and verify that the meter reads between 10 and 12 Watts.

4. Using the spectrum analyzer, monitor the modulated RF output of the STL transmitter. The controls of the spectrum analyzer should be in the following positions:

Frequency Band GHz	01-3
Time/DIV	Auto
Trigger	Free run
FREQ/SPAN/DIV	50 kHz/DIV with 3 kHz bandwidth
Input ATTEN	30
REF Level	-20
10 dB/DIV	Depress
Tuning	STL transmitter center frequency.

5. Disconnect the BNC connector from the composite input of the transmitter and adjust the display on the spectrum analyzer so that the waveform is at the top graticule (see Figure A4-4A).

   Reconnect the BNC connector to the composite audio input of the STL transmitter. The display on the spectrum analyzer should be similar to Figure A4-4B.

   Adjust PGM Level Adjust R23 on the Composite Audio Processor module for a Bessel null function of at least -50 dB on the spectrum analyzer.

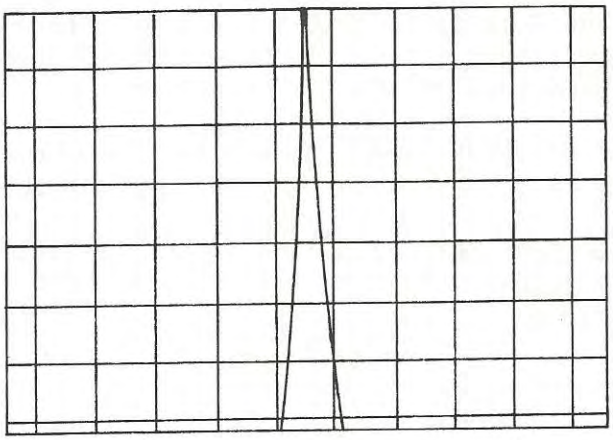
   Using the METER FUNCTION switch on the STL transmitter, select the PGM LEVEL function. Adjust R23 on the STL transmitter Metering and Status board for a reading of 0 dB on the top scale of the meter.

6. Using the METER FUNCTION switch on the STL receiver, select the RF LEVEL position.

   Position the switches on the adjustable attenuator for an RF level reading between 1 mV and 3 mV on the receiver RF indicator.

   Set the controls on the distortion measurement set as follows:

Meter Function	Reference level
Frequency	1.0 kHz
Meter Input Range	+10 dB



(A)

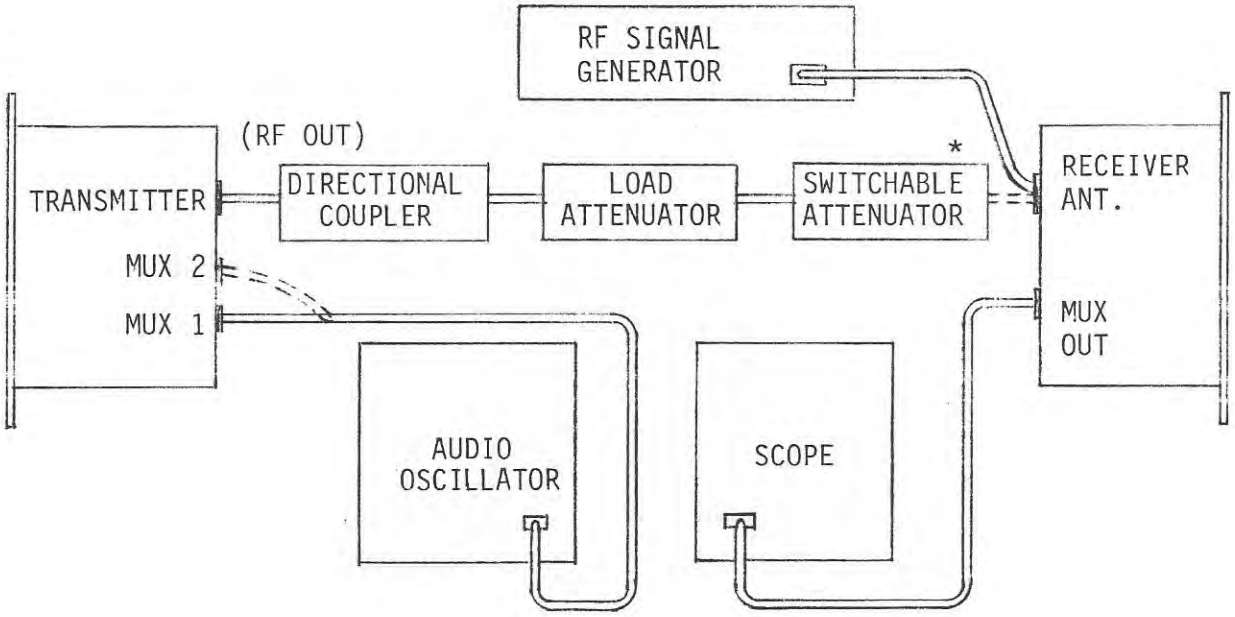
(B)
Vert = 10 dB/Div
Hor = 50 kHz/div and
3 kHz bandwidth

Figure A5-4. Bessel null function waveforms.

With the oscillator output connected to the STL transmitter, connect the meter input in parallel with the oscillator output and adjust the Relative Adjust for a 0 dB reference on the distortion measurement set. Reconnect the distortion input to the composite output of the STL receiver.

On the receiver MAIN BOARD, adjust Baseband Level Adjust R41 for a reading of 0 dB on the distortion measurement set.

Using the receiver METER FUNCTION switch, select the PGM LEVEL position and adjust R54, on the Main board for a reading of 0 dB on the top scale.



CAUTION: Place the transmitter RF Power switch in STANDBY until the coupler and attenuator are connected.

*CAUTION: To avoid receiver damage, initialle set attenuator for maximum attenuation.

Figure A5-5. Test setup for MUX channel alignment

7. Position the STL transmitter RF Power switch to the STANDBY position.

   Connect the equipment as shown in Figure A4-5, and adjust the controls on the RF signal generator as follows:

Meter Function	FM
AM	Off
Modulation Frequency	110 kHz
FM	INT
Peak Deviation	10 kHz
Range	1024/512 MHz
Output Level	-40
RF	On
Frequency	Tune to the frequency specified on serial number label of STL receiver.
Peak Deviation	Adjust FM control for a meter reading of 12 kHz.

   While monitoring the oscilloscope, adjust MUX Level Adjust R13 on the STL receiver Filter/Amplifier Board module for a reading of .54 Vrms.

   Using the receiver METER FUNCTION switch, select the MUX LEVEL position.

   Meter should be indicating 100% on the "%" scale of the receiver meter.

8. On the RF signal generator, adjust the modulation frequency to 185 kHz and the FM deviation for 12 kHz.

   Note the reading on the receiver meter. It should be between 100% and 102% on the "%" scale. This reading will be used as a reference to align the transmitter MUX 2 deviation. Connect the output of the adjustable attenuator to the RF input of the STL receiver.

9. Position the STL transmitter RF Power switch to the ON position.

   Using the scope, adjust the output of the audio oscillator for a voltage of .54 Vrms, and a frequency of 152 kHz. Connect the audio oscillator output to the MUX 1 input of the STL transmitter.

   Adjust R31 on the transmitter Meter board for a reading of 100% on the meter.

   Adjust the MUX 1 Level Adjust R32 on the transmitter Meter Board for a reading of 100% on the receiver meter.

   Using the transmitter METER RUNCTION switch, select the MUX LEVEL position.

   Connect the audio oscillator to the transmitter MUX 2 input and adjust the oscillator to a frequency of 185 kHz.

Using the receiver meter as a reference, on the transmitter meter board, adjust MUX 2 Level Adjust R31 for the reading noted in paragraph. The meter reading on the transmitter front panel should be between 90% and 102% on the scale.

Troubleshooting:

1. When aligning STL systems as a dual or redundant installation, one STL transmitter should be used as a reference. In this case, the second STL transmitter would be aligned using the first STL receiver as a reference. The second STL receiver would be aligned using the first STL transmitter as a reference. As a final verification, the second STL transmitter would be checked using the second STL receiver. Using any combination of transmitter and receiver, the composite band should be flat within +0.1 dB. The results from the multiplex band measurements should be within 10%.
2. The multiplexed output is lowest when the carrier center frequency of the transmitter and receiver are identical. This phenomenon is more pronounced when the STL receiver is in the narrow I.F. mode.

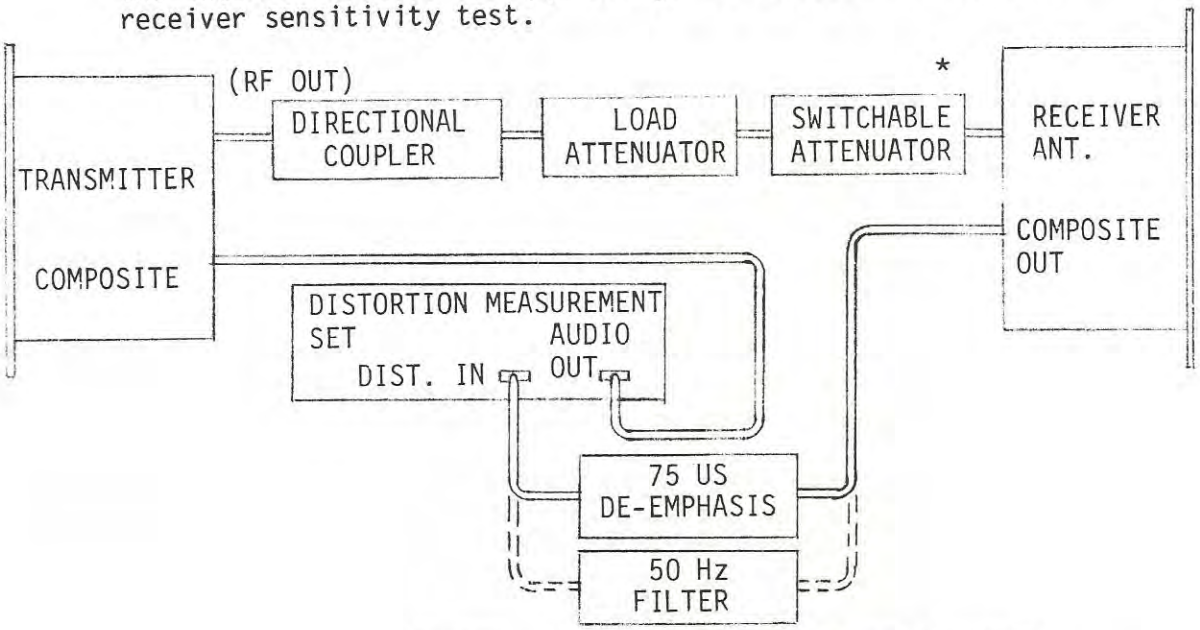
A.5.2.4 Ultimate Signal-to Noise Ratio

Typical Values:

Ultimate wideband SNR	65 dB or better
75 Us de-emphasized	76 dB or better

Description:

The STL ultimate wideband (50 Hz to 75 kHz) and 75 Us de-emphasized SNR are verified using a distortion measurement set. Stereo SNR is verified during the stereo separation test, and the STL receiver SNR (quieting) is verified during the receiver sensitivity test.



CAUTION: Place the transmitter RF Power switch in STANDBY until the coupler and attenuator are connected.

*CAUTION: To avoid receiver damage, initially set attenuator for maximum attenuation.

Figure A5. Test setup for signal-to-noise ratio measurement.

Test Equipment:

Directional Coupler	Microlab/FXR CB-49N
Attenuator, 50Ω Load	Philco, 662A-30
Attenuator, Adjustable	Kay Elemetrics Corp., 432D
Distortion Measurement Set	Hewlett-Packard, HP-339A
50 Hz High Pass Filter	(see Figure A4-15)
75 Us De-emphasis Metwork	(see Figure A4-16)

Procedure:

1. Connect the equipment as shown in Figure A5-6, and set the controls on the distortion measurement set as follows:

Meter Function	REF Level
Meter Input	+10 dBm
Frequency	400 Hz

2. Set the controls on the STL transmitter as follows:

RF Power	ON
METER FUNCTION	PGM LEVEL

3. Using the METER FUNCTION switch on the STL receiver, select the PGM LEVEL position.
4. Adjust the oscillator output level on the distortion measurement set for a reading o 0 dB on the top scale of the transmitter meter.

   Rotate the REFERENCE ADJUST on the distortion measurement set for a 10 dB reference on its front-panel meter. Disconnect the composite input at the STL transmitter rear panel.

   Using the INPUT RANGE switch on the distortion measurement set, measure the ultimate wideband SNR. (Note: The reference is +10 dB; hence, a meter input range indicating -60 and a meter reading of -6 would indicate and SNR of -76 dB.)
5. Position the INPUT RANGE switch to +10 dB and reconnect the audio input to the STL transmitter composite BNC connector.

   Remove the 50 Hz high-pass filter from the distortion measurement set and replace it with the 75 Us de-emphasis network.

   Rotate the RELATIVE ADJUST on the distortion measurement set for a reference of 10 dB.

   Disconnect the audio input from the STL transmitter composite BNC connector.

   Measure the de-emphasized SNR using the same method described above.

Troubleshooting:

1. If the STL link fails to meet the ultimate SNR specification, the sensitivity test (paragraph) should be performed on the receiver prior to troubleshooting the transmitter.
2. If the STL link fails to meet the SNR specification, and the transmitter is suspected, the following method may be used to help isolate the problem:

   a. Using the 80 kHz filter on the distortion measurement set, measure the output of the meter board for a reading at least 3 dB greater than specified for the ultimate SNR.

2. b. Substitute the first sampling P.L.L. (876.50 MHz) using an RF signal generator such as the HP-8640B at an output level of +10 dBm.

c. Substitute the VCO /Modulator signal using the RF signal generator at an RF level of +7 dBm.

The STL center frequency may be obtained from the serial number label on the back of the STL transmitter.

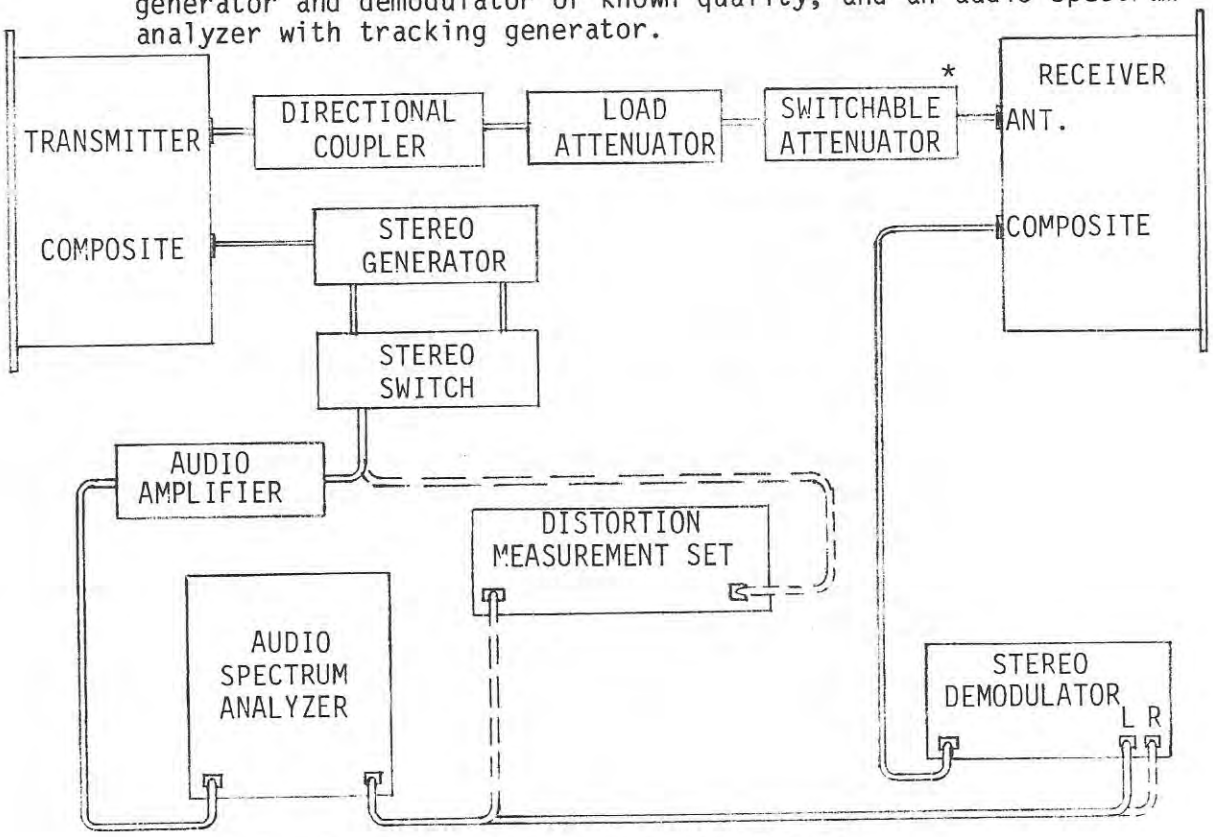
A5.2.5 Stereo Separation and Stereo Signal-to-Noise Ratio

Specification:

Separation	50 dB or better from 50 Hz to 15 kHz.
Signal-to-Noise Ratio	75 dB or better (typically 77 dB or better).

Description:

The stereo separation alignment is accomplished using a stereo generator and demodulator of known quality, and an audio spectrum analyzer with tracking generator.



CAUTION: Place the transmitter RF Power switch in STANDBY until the coupler and attenuator are connected.

*CAUTION: To avoid receiver damage, initially set attenuation.

Figure A5-7. Stereo separation test setup

Test Equipment:

Directional Coupler	Microlab/FXT CB-49N
Attenuator, 50 ohm Load	Philco, 662A-30
Attenuator, Adjustable	Kay Elemetrics Corp., 432D
Distortion Measurement Set	Hewlett-Packard HP-330A
Spectrum Analyzer	Tektronics 7L5 with Option 01, and Main Frame
Audio Amplifier	See Figure 6-17
Stereo Generator	CN ROOD Model 203
Stereo Demodulator	TFT 724A
Stereo Source Selector	(Internal in CN ROOD 203)

Procedure:

1. Connect the equipment as shown in Figure A5-7. This test should be run flat;i.e., the stereo generator pre-emphasis and the stereo demodulator de-emphasis should be switched out. If this cannot be accomplished, the system modulation reference level should be reduced to -20 dB at 400Hz. Adjust the controls on the audio spectrum analyzer as follows:

Frequency	Far left graticule
Dot Frequency	Zero Hz
Log	10 dB
Source	FREE RUN
Mode	NORM
Terminate	1 M
REF	dBV
Resolution	Coupled
SPAN/DRV	2 kHz
Time/DIV	Auto
Tracking GEN	ON

2. Set the RF Power switch on the STL transmitter to the ON position.

   Using the METER FUNCTION switch on the transmitter, select the FWD POWER position. Verify that the meter reads between 10 and 12 watts.

   Using the METER FUNCTION switch on the transmitter, select the PGM LEVEL position.

   Adjust the level control on the audio spectrum anaylzer to 1.0 kHz, and the SPAN/DIV to zero.

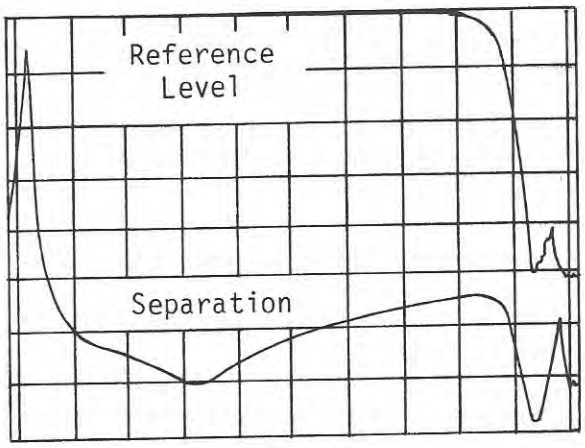
   Adjust the level control on the audio spectrum anyalyzer for a reading of zero dB on the top scale of the transmitter meter.

   Set the dot frequency on the audio spectrum analyzer to zero and the SPAN/DIV to 2 kHz.

   Using the METER FUNCTION switch on the receiver, select the RF LEVEL position.

2. cont. Position the switches on the adjustable attenuator for a reading between 1 mV and 3 mV on the receiver RF Level indicator.

Using the METER FUNCTION switch on the STL receiver, select the PGM LEVEL position. Verify that the meter reads within ±1 dB of the STL transmitter meter.



Vert = 10 dB/div Hor = 2 kHz/div

Stereo separation: Measurement of the worst-case ratio in dB of residual signal in the stereo demodulated right channel referred to the demodulated left channel with a left-only driving signal for frequencies between 30 Hz and 15 kHz; the procedure is repeated for right to left channel separation.

Figure A5-8. Swept separation waveform.

3. Select the LEFT ONLY position on the stereo source selector.

Adjust the step and VAR attenuators on the audio spectrum analyzer so that the waveform is at the top graticule. (See Figure A5-8.)

Select the RIGHT ONLY position on the stereo source selector.

Adjust R31 on the receiver Main Board for maxuim seperation between 10 and 15 kHz.

Verify that the separation is greater than 50 dB between 1 kHz and 15 kHz.

4. Connect the spectrum analyzer to the right output of the stereo demodulator.

Select the RIGHT ONLY position on the stereo source selector. Adjust the step and variable attenuators on the audio spectrum analyzer so that the waveform is at the top graticule. (See Figure A5-10.)

Select the LEFT ONLY position on the stereo source selector. Verify that the separation is greater than 50 dB between 1kHz and 15 kHz.

5. Connect the audio output of the distortion measurement set to the stereo source selector. Connect the left output of the stereo demodulator to the input of the distortion measurement set.
Set the frequency on the distortion measurement set to 1 kHz.
Select the LEFT + RIGHT position on the stereo source selector.
Adjust the output level on the distortion measurement set for a reading of zero dB on the top scale of the STL transmitter.
Using the METER FUNCTION switch on the STL receiver, select the PGM LEVEL position and verify that the meter reads within ±1 d B of the transmitter program level.
Adjust the input controls on the distortion measurement set for a zero dB reference.
Set the frequency on the distortion measurement set to 50 Hz.
Verify that the reference on the distortion measurement set is +0.5 dB.
Select the RIGHT ONLY position on the stereo source selector.
Using the input attenuator on the distortion measurement set, measure the separation.
Verify the separation at 50, 100 and 500 Hz.
6. Connect the input of the distortion measurement set to the right channel of the stereo demodulator.
Position the input range and relative ADJ controls on the distortion measurement set for a zero dB reference.
Select the RIGHT ONLY position on the stereo source selector and, if required, adjust the zero dB reference on the distortion measurement set.
Select the LEFT ONLY position on the stereo source selector.
Using the input range controls on the distortion measurement set, measure the right channel separation.
7. Stereo signal -to-noise ratio. This test should be run using the normal 75 µs de-emphasis characteristics of the stereo demodulator.
Connect the audio output of the distortion measurement set to the stereo source selector.
Set the stereo source selector to the LEFT + RIGHT position.
Using the 50 Hz high-pass filter, connect the left channel of the stereo demodulator to the distortion measurement set input.
Using the METER FUNCTION switch on the STL transmitter, select the PGM LEVEL position.
Adjust the output of the audio oscillator on the distortion measurement set for a frequency of 400 Hz.
Adjust the output level on the distorion measurement set so that the transmitter meter reads zero dB on the top scale.
Using the METER FUNCTION switch on the receiver, select the PGM LEVEL position, and verify that the meter reads within ±1 dB of the transmitter meter.
Adjust the input range and relative ADJ controls on the distortion measurement set for a zero dB reference on its meter.
Position the stereo source selector to the OFF position.
Measure the stereo demodulated signal-to-noise ratio for the left channel using the input range control on the distortion measurement set. This value should be greater than 72 dB.
Using the 50 Hz high-pass filter, connect the input of the distortion measurement set to the right channel, and repeat the test.

Troubleshooting

The performance of the stereo generator and stereo demodulator can be verified by connecting the output of the stereo generator directly to the input of the stereo demodulator.

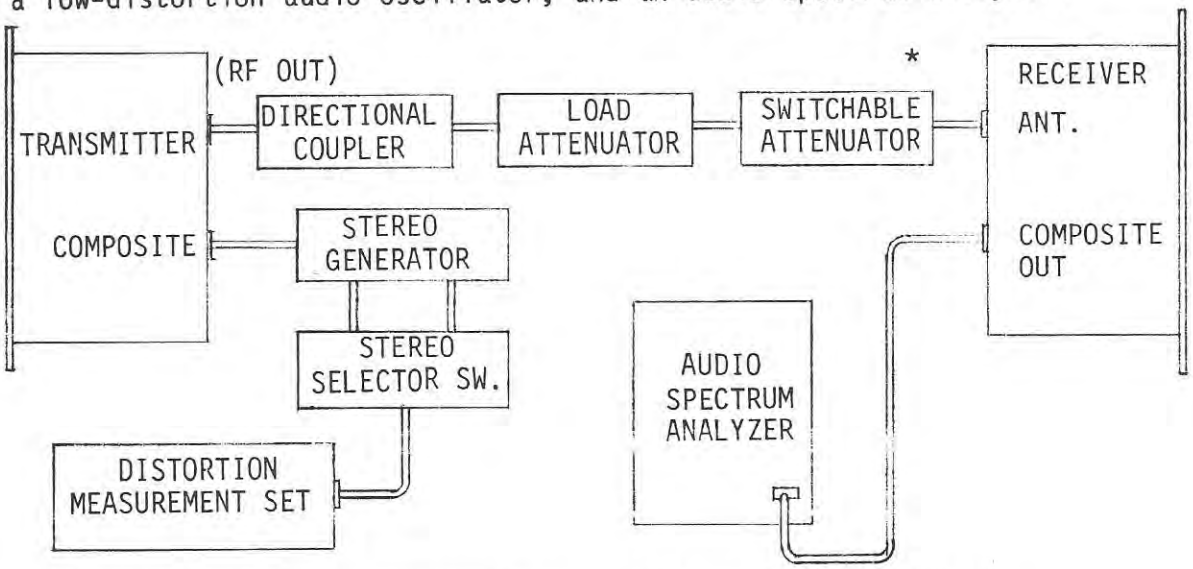
A5.2.6 Stereo Crosstalk

Specification:

Subchannel to main channel	50 dB or better
Main channel to subchannel	50 dB or better

Description

The crosstalk measurements are made using a streo generator of known quality, a low-distortion audio oscillator, and an audio spectrum analyzer.



CAUTION: Place the transmitter RF POWER switch in STANDBY until the coupler and attenuator are connected.

* CAUTION: To avoid receiver damage, initially set attenuator for maximum attenuation.

Figure A5-9. Stereo crosstalk test setup.

Test Equipment

Directional Coupler	Microlab/FXR CB-49N
Attenuator, 50 ohm Load	Philco 662A-30
Attenuator, Adjustable	Kay Elemetrics Corp. 432D
Distortion Measurement Set	Hewlett-Packard HP-339A
Audio Spectrum Analyzer	Tektronix 7L5
Stereo Source Selector	(Internal on CN. Road 203)
Stereo Generator	CN. Rood Model 203

Procedure

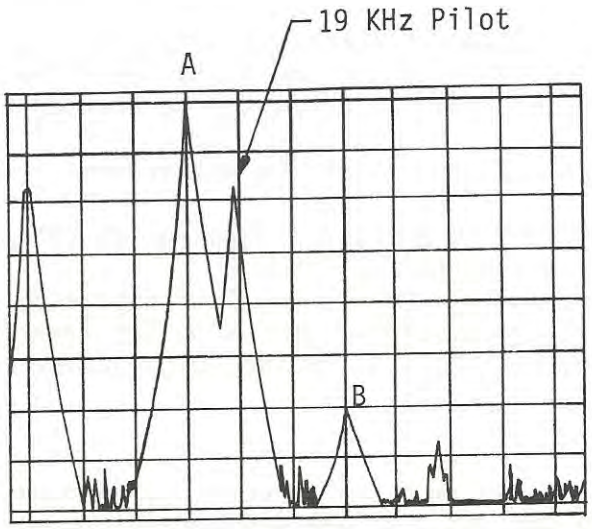
1. Connect the equipment as shown in Figure A5-9. This test should be run with the stereo generator pre-emphasis switched out.
2. Set the RADIATE/STANDBY switch on the STL transmitter to the RADIATE position. The RADIATE status LED should be green. Using the METER FUNCTION switch, select the FWD POWER position, and verify that the meter of the STL transmitter reads between 10 and 12 watts.

2. cont. Using the METER FUNCTION switch on the transmitter, select the PGM LEVEL position.
Adjust the frequency controls on the distortion measurement set for a value of 15 kHz.
Adjust the oscillator output level on the distortion measurement set to that the transmitter meter reads zero dB on the top scale.

3. Position the switches of the adjustable attenuator so that the receiver bargraph reads 1 mV.
Using the METER FUNCTION switch on the receiver, select the PGM LEVEL position. Verify that the receiver meter reads between -1 and +1 dB on the top scale.

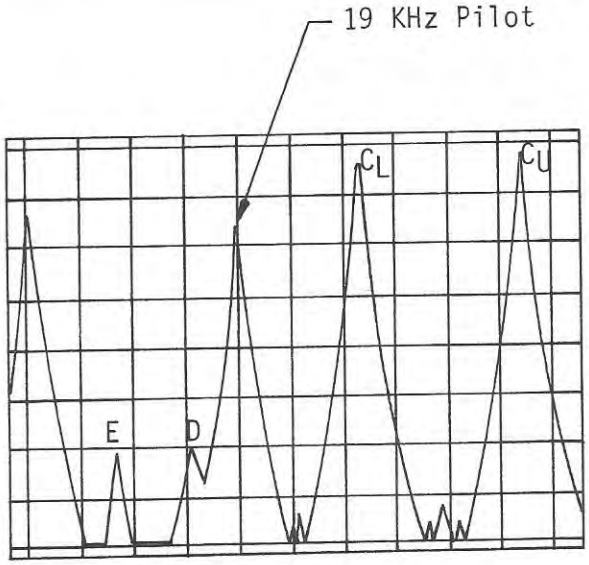
4. Position the controls on the audio spectrum analyzer as follows:

DOT MAR	Dot on far left graticule
DOT FREQUENCY	Zero Hz
LOG	10 dB/DIV
SOURCE	Free run
MODE	NORM
RESOLUTION	Coupled
SPAN/DIV	5 kHz
TIME/DIV	AUTO
TERMIN Z	1 M ohm
REF	dBV



A=15 kHz L+R Ref. level.
B=2nd harmonic distortion level at 30 kHz.
Nonlinear crosstalk main to sub = the difference in dB between level A and level B (60 dB in this example).

Vert = 10 dB/.div Hor = 5 kHz/div
(A) Nonlinear crosstalk, main to sub.



CL and CU = lower and upper L-R sideband level at 30.5 kHz and 45.5 kHz.
D=intermodulation product at 15 kHz.
E=linear (vector) crosstalk at 7.5 kHz. This signal is a product of the stereo generator.
Nonlinear crosstalk sub to main=the difference in dB between level CL or CU and level D + 6 dB (60 dB in this example).

Vert = 10 dB/div Hor = 5 kHz/div
(B) Nonlinear crosstalk, sub to main.

Nonlinear crosstalk: Measurement of the ratio in dB of harmonic products in the subchannel referred to 15 kHz L+R at 100% modulation in the main channel (M+S); measurement of the ratio in dB of intermodulation products in the main channel referred to 7.5 kHz L-R at 100% modulation in the subchannel (S+M).

Figure A5-10. Nonlinear crosstalk.

5. Measure the stereo crosstalk as follows:
   a. Using the attenuator on the audio spectrum analyzer, adjust the 15 kHz waveform to the top graticule. (See Figure A5-10).
   b. Calculate the main channel to subchannel crosstalk by measuring the indicated waveforms and using the formula shown in Figure A5-10. This value should be greater than 50 dB.
   c. Adjust the frequency of the distortion measurement set to 7.5 kHz.
   d. Position the stereo source selector (Internal in CN ROOD 203) to the left minus right position.
   e. Calculate the subchannel to main channel crosstalk by measuring the indicated waveforms and using the formula shown in Figure A5-10B. This value should be greater than 50 dB.

Troubleshooting

1. The stereo generator's performance can be verified by connecting the composite output to the input of the audio spectrum analyzer and performing the tests specified in step 5 above.
2. If the STL link is identified as the source of excessive stereo crosstalk, the following steps should be taken:
   a. Verify that the cover is on the RF amplifier, and install the covers on the STL transmitter and receiver using at least two screws.
   b. Ensure that the STL transmitter and receiver are more than 2 feet apart.
   c. Verify that distortion is less than 0.2%, using the procedure shown in part A5.3.5.

Module Adjustments

A5.3 This subsection is intended to aid in alignment of individual modules.

8301	Sampling Phase Lock Loop L.O.	6608-3375	
8301	Front End Board	6608-3347	
8301	63 MHz to 850 kHz I.F. Board	6608-3360	
8301	Main Board	6608-3363	
8301	Bar Graph Display Board	6608-3346	
8300	VCO/Modulator	6608-3377	A2-A2
8300	VCO/Mod Synthesizer	6608-3376	A2-A3
8300	Output VCO Board	6608-3374	A2-A4
8300	1 Watt Driver Board	6608-3378	A2-A5
8300	A1 Power Amp Assy	5102-3384	A1
8300	Meter Board	6608-3395	A3
8300	Bargraph Display	6608-3348	A4
8300	Sampling Phase Lock Loop Upconverter (Refer to 8301)	6608-3375	A2-A1

Test Equipment

RF Generator	Hewlett-Packard HP-8640B
Attenuator, Adjustable	Kay Elemetrics 432B
RF Spectrum Analyzer	Hewlett-Packard HP-8559B
Distortion Measurement Set	Hewlett-Packard HP-339A
Counter	Fluke
Multimeter	Data Precision 238
FM Demodulator	(See Figure A5-20)

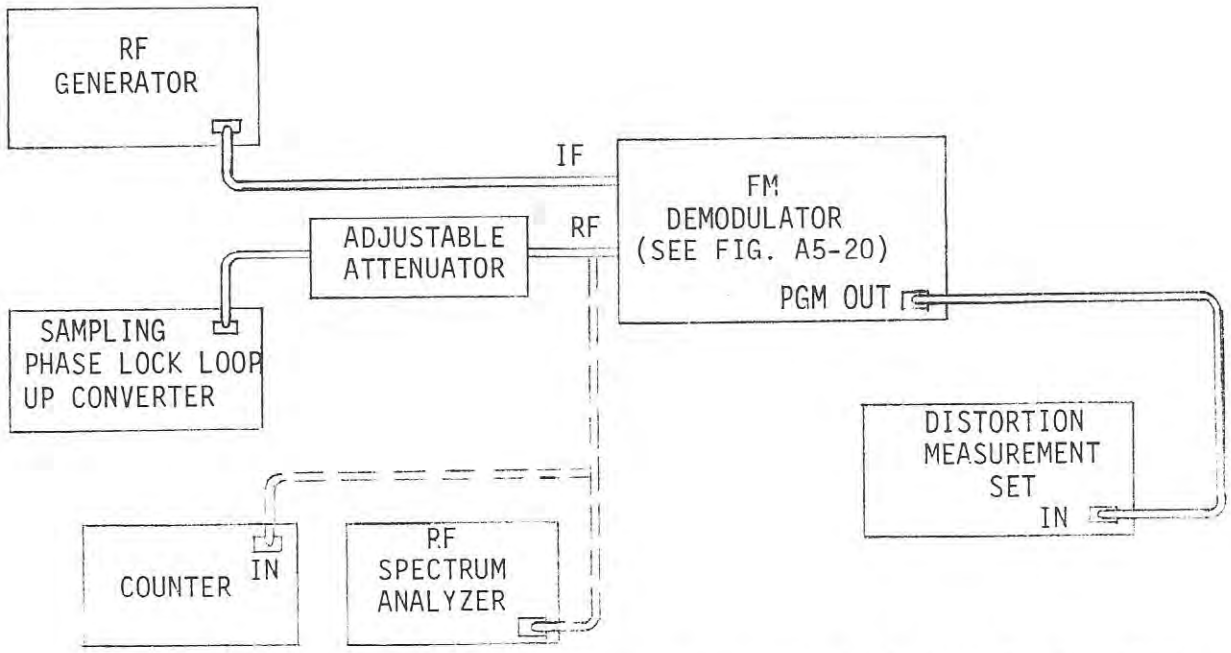


Figure A5-11. Test set-up for Sampling Phase Lock Loop Upconverter.

Procedure

1. Connect Frequency counter to the emitter of Q6.
2. Adjust C22 for exact crystal frequency (87.6500 MHz).
3. Short the juction of R20, R23, and R21 to ground. Looking at the Ø V T.P. with an oscilloscope DC coupled, adjust R28 for a symmetrical waveshape (Time High is equal to Time Low).
4. Remove short from board.
5. Connect spectum analyzer to RF output of board.
6. Connect DC Voltmeter to Ø V T.P.
7. Adjust C9 for a DC Voltage that is as close to Ø volts as possible and still remain locked on the proper harmonic. Frequency should be exactly 10 time crystal frequency.
8. RF output should be approximately +10 dB to ±2 dB.
9. Connect frequency counter to center RF output, check L.O. frequency.
10. Connect RF output into adjustable attenuator. Set 8640 B to 875.650 MHz at +7 dBm.
11. Modulate the 8640 B to 50 kHz deviation at 400 Hz. Take reference output from audio out on FM Demodulator into distortion test set.
12. Turn off modulation and measure signal-to-noise ratio. It should be ≥-63 dB.
13. Using DVM measure the DC voltage at CR8 cathode. Voltage should be 1VDC ±.2V.

Test Equipment

RF Generator	Hewlett-Packard HP-8640B or Equiv.
Spectrum Analyzer	Hewlett-Packard HP-8559B

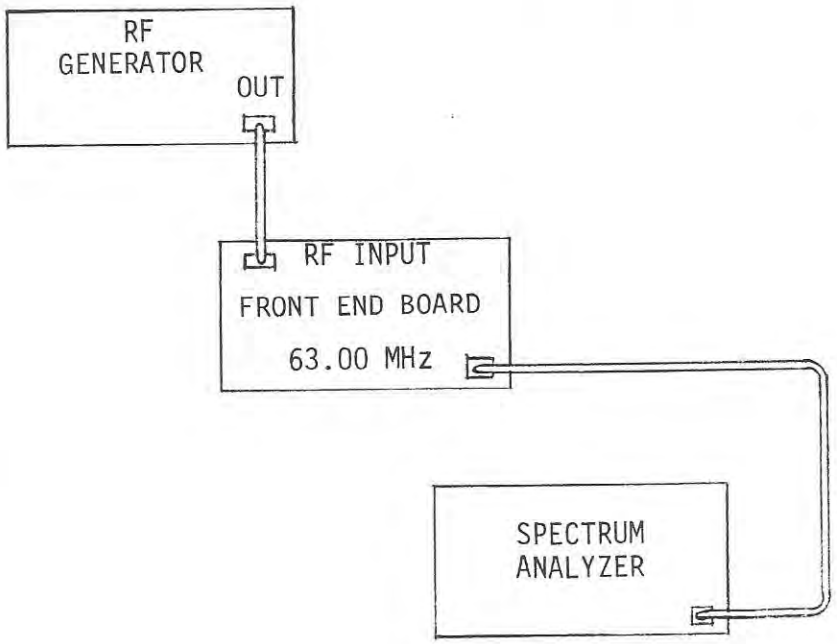


Figure A5-12. Test set-up for Front End Board (6608-3347).

Procedure

1. To test the front end board, it is necessary to have the L.O. Board operational. Inject the RF signal into J1 on the front end board at the RECEIVE frequency.
2. Connect the spectrum analyzer to the 63 MHz output. Adjust the spectrum analyzer for 63 MHz.
3. Adjust the 8640B output level to -43 dBm. The 63 MHz signal on the spectrum analyzer should be -21 dBm ±2dB.
4. Depress the RF gain switch on the front panel of the 8301. The output level on the spectrum analyzer should drop by 10 dB ±1 dB.

Test Equipment

Signal Generator	Hewlett-Packard HP-8640B
Multimeter	Data Precision 238
Spectrum Analyzer	Hewlett-Packard HP-8559B
Distortion Test Set	Hewlett-Packard HP-339B
Attenuator	Sierra 611A-30
Attenuator, Adjustable	Kay Elemetrics 432B

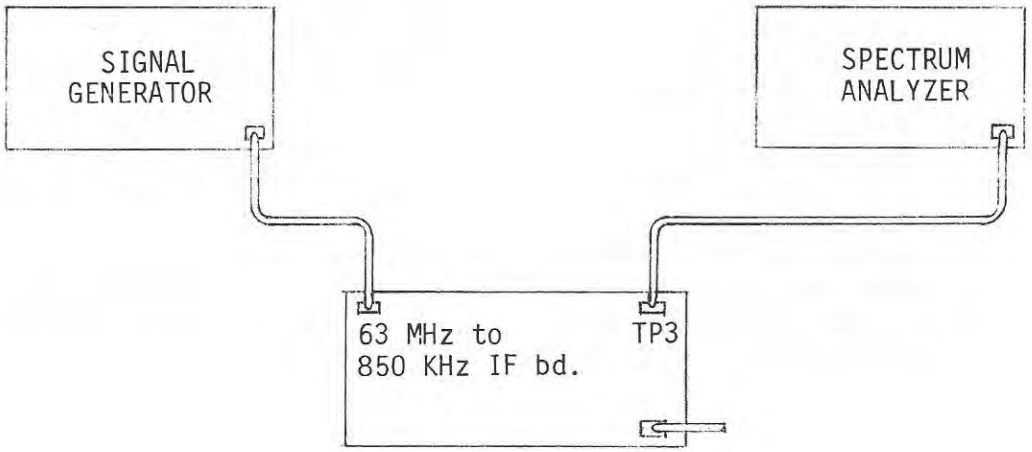


Figure A5-13. Test set-up for 63 MHz to 850 kHz I.F. Board (6608-3360).

Procedure

1. Set up the equipment as shown in Figure A5-13. Adjust the 8640 to 63.00 MHz at an RF level of -40 dBm.
2. Lift one end of cap C6, .01ufd, (the end connected to R6, 51ohm.) Inject the signal from the 8640 into the lifted side of C6. Short the base of Q7 to ground.
3. Remove U2 to defeat the AGC, and connect the spectrum analyzer to T.P. 3. Set the spectrum analyzer for a center frequency of 63 MHz, a bandwidth of 30 kHz, scan time of approximately 5msec, input attenuation of -10 dB/div. 100 kHz/divison scan width.
4. Sweep the 8640 frequency manually ±1 MHz.

5. Tune C11, C14, C18, and L6 for high gain at 63 MHz and a symetrical waveshape response. [See figure A5-14(B).] The filter output level should be approximately -26 dBm.
   Note: If any tuning stage can not be tuned above and below 63 MHz, capacitor C10, C15, or C19 may be changed by ±3pf for proper tuning range.
6. Change the spectrum analyzer for a scan width of .5 MHz, input attenuation of -25 dBm, and 2 dBm/div.
7. Sweep the 8640 ±2.5 MHz from the center frequency of 63 MHz.
8. On this expanded scale, fine tune C11, C14, C18, and L6 for a symetrical waveshape. [See figure A5-14(A).]
9. Place C6 back down on the PCB and inject the 8640 into the 63 MHz I.F. input. Set spectrum analyzer back to the 10 dB/div. settings shown in steps 3 through 5. Make sure that the symetry through the saw filter and the tuned filter is good. Tune L1 and L2 for a symetrical waveshape. Re-install U2, and disconnect the spectrum analyzer from T.P. 3. Remove short from Q7 base. Solder jumper from E1 to E2.
10. Connect 850 kHz output to main board 850 kHz input.
11. Set the 8640B to an RF level of 1mV.
12. Using the RF Voltmeter measure 62.15 L.O. output level at C32. It should be .5VRMs or +7 dBm.
13. Measure AGC with a DC voltmeter and set using R58 for 1 VDC.
14. Connect the receiver to the transmitter through the appropriate attenuators to obtain an RF level of -47 dBm.
15. Connect the audio generator to the audio input of the 8300. Set level for 1.24 RMs at 38 kHz.
16. Adjust L10 and L11 for lowest AGC voltage possible. Monitor both distortion and AGC while tuning L1 and L2. Adjust for lowest distortion while keeping the AGC voltage at as low a level as possible.
17. Reset AGC for 1 vDC.
18. Measure distortion at 1 kHz, 15 kHz, 25 kHz, and 38 kHz.
19. Inject the 8640 into the out input of the of the 8301 at 1mV. Check AGC +1 vDC. Adjust if necessary.

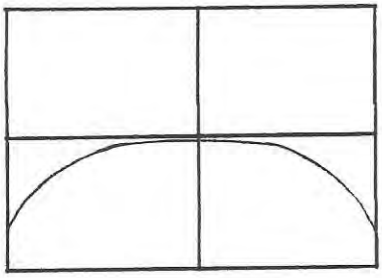


Figure A5-14(A)

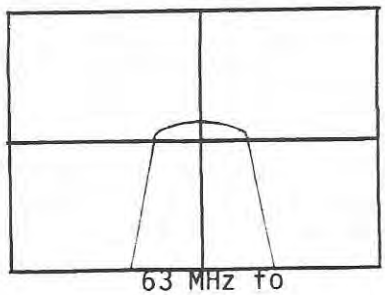


Figure A5-14(B)

Test Equipment

RF Generator	Hewlett-Packard HP-8640B
Distortion Test Set	Hewlett-Packard HP339A
Mixer	Mini-Circuits ZAD-2
Attenuator, Adjustable	Kay Elemetrics 432B
Attenuator, 30 dB	Sierra 611A-30
Stereo Generator	CN. Rood
Stereo Demodulator	TFT 724A

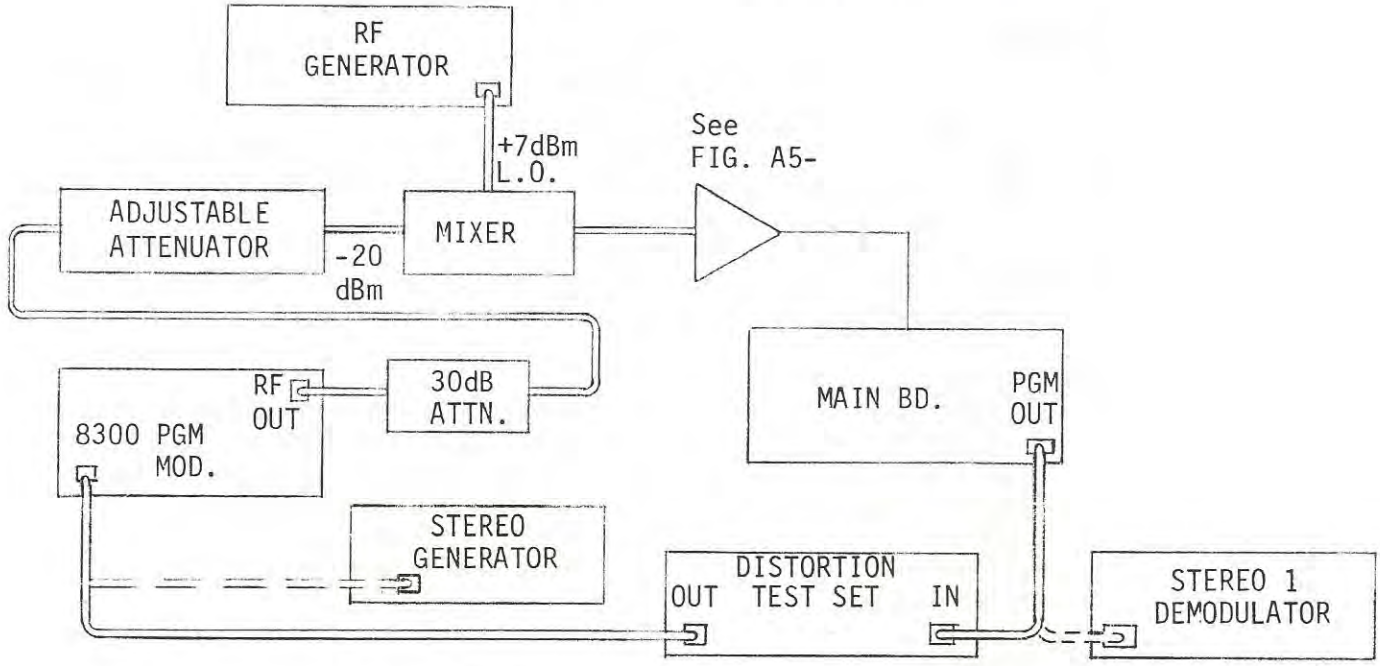


Figure A5-15. Main Board test set-up.

Procedures

1. Connect equipment up as shown in Figure A5-15. The 8300 used in the test setup must be operating within specifications.
2. With the I.F. Bandwidth switch in the wide position and the 8300 being modulated to ±50 kHz deviation at 400 Hz, check the output level of the PGM. It should be 1.24 VRMs ±.05 V.
3. Measure distortion at 400 Hz, 1 kHz, 5 kHz, and 15 kHz. The distortion should be within specifications of the 8301.
4. Measure stereo separation from 40 Hz to 15 kHz, using the internal generator on the stereo generator. The separation should be greater than 50 dB over the 40 - 15 kHz band.
5. Measure SNR using the distortion test set. It should be greater than -60 dB below 100% without de-emphasis.
6. Procede with steps 3, 4, and 5 with the I.F. Bandwidth switch in the narrow position.
   Distortion should be less than .3%.
   Stereo separation should be greater than 45 dB.
   SNR should be greater than 60 dB below 100% modulation.
7. With the meter function switch in the +12 volt position adjust R54 for a 12 volt indication on the meter.

8. With ±50 kHz deviation at 400 Hz applied to the receiver adjust R62 for 100% on the PGM meter position.

8301 Bargraph Display (6608-3346)

Test Equipment

Multimeter	Data Precision 238
Signal Generator	Hewlett-Packard HP-8640B

Procedures

1. Inject RF into the ant input of the receiver at 1mV with ±50 kHz deviation at 400 Hz modulation. Check the AGC line with the multimeter, it should be +1 volt DC.
2. Observe the bargraph display. Adjust R30 for 100% reading.
3. Adjust R4 to indicate 1mV RF level, make sure the RF gain switch is in the high gain position.
4. Reduce the level to 40 µV and adjust R38 for 40 µV indication.
5. Repeat step 4 for 100µV, 400µV, and 3 mV levels and the corresponding pot for each level.

Test Equipment

RF Generator	Hewlett-Packard HP-8640B or Equiv.
Attenuator, Adjustable	Kay Elemetrics 432B or Equiv.
Distortion Test Set	Hewlett-Packard HP-339A or Equiv.
Spectrum Analyzer	Hewlett-Packard HP-8559A
Counter	Fluke or Equiv.
Multimeter	Data Precision 248
FM Demodulator	(See Figure A5-20)

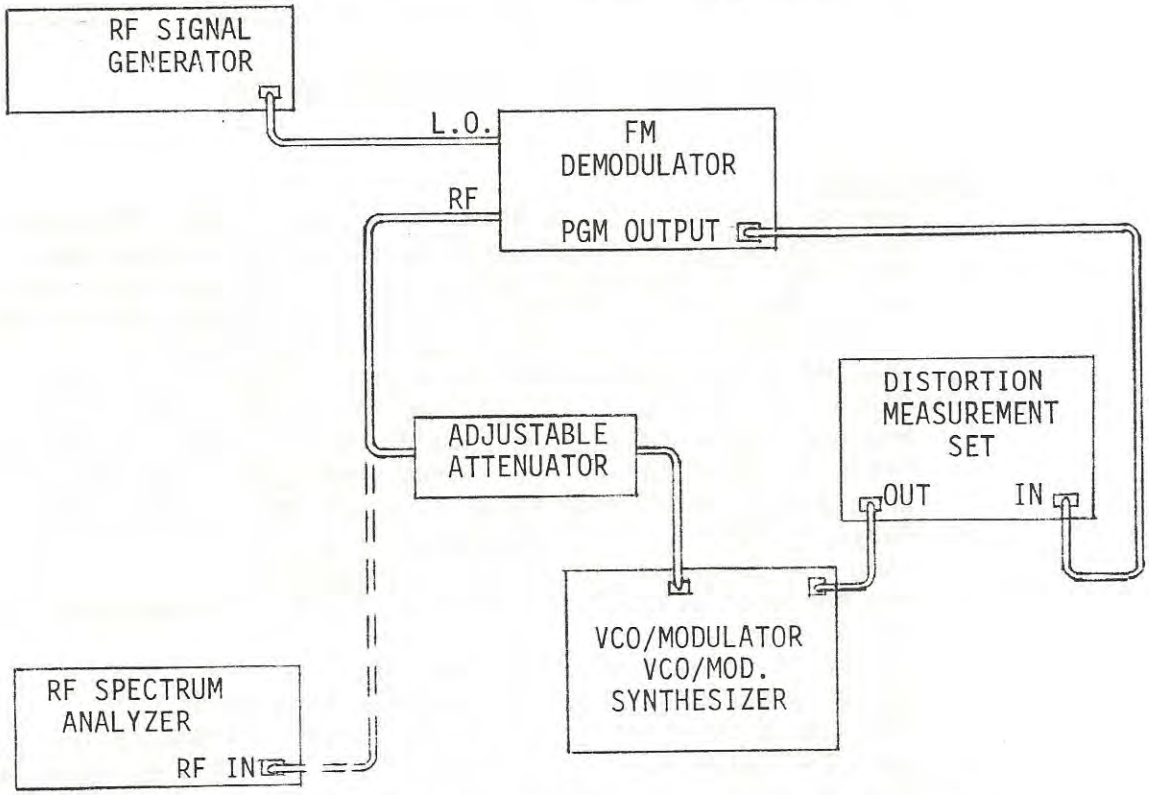


Figure A5-16. Test set up for VCO/Modulator Adjustment.

VCO/Modulator and VCO/Mod Synthesizer

VCO/Modulator (6608-3377)

Linearity Adjustment	Adjustment for minimum distortion
C15	VCO/Mod Frequency adjustment
E3	Test point for monitoring output level of VCO/modulator

VCO/Mod Synthesizer (6608-3376)

TPI	Phase detector output
ALM	Alarm output for detecting loss of lock
5 MHz	5 MHz ref output

VCO/Modulator Output Frequency =
Transmitter Output Frequency Minus 876.50 MHz
÷N =
VCO/Modulator Frequency Divided by 50 kHz or 62.5 kHz increment depending on if offset is required

BINARY CONVERSION TABLE

2048	1024	512	256	128	64	32	16	8	4	2	1

Subtract each quantity from ÷N number. Put a "1" above number if it is equal to or greater than, or "0" if less than.

Example: Transmitter frequency = 950.00
Increment is 50 kHz

VCO/Modulator Frequency = 950.00 - 876.50
= 73.50 MHz
÷N = 73.50 MHz/50 kHz
N = 1470

1470 is less than 2048		0
1470 minus 1024 =	446	1
446 is less than 512		0
446 minus 256 =	190	1
190 minus 128 =	62	1
62 is less than 64		0
62 minus 32 =	30	1
30 minus 16 =	14	1
14 minus 8 =	6	1
6 minus 4 =	2	1
2 minus 2 =	0	1
0 minus 1 =	-1 (No remainder)	0

0	1	0	1	1	0	1	1	1	1	1	0
2048	1024	512	256	128	64	32	16	8	4	2	1

Procedure:

1. Connect equipment as shown in figure A5-16.

2. Adjust the controls on the RF generator for a frequency that is 850 kHz below the VCO/Modulator frequency.

   VCO/Modulator Freq = Transmitter Frequency minus 876.50 MHz

   Using the spectrum analyzer adjust the adjustable attn for -15 to -20 dBm from the mixer.

   Reconnect the mixer to the FM demodulator.

3. Adjust the oscillator output on the distortion measurement set for a frequency of 1 KHz and a level of 1.24 V rms (3.5 V p-p).

4. Distortion and AFC Level Alignment.

   Using the multimeter, monitor V T.P. and adjust the VCO/MOD adjust so that the voltmeter reads between 4.0 and 4.5V.

   Using the distortion measurement set, verify that the output of the FM demodulator is between 1.0 and 1.5 V rms.

   Measure the distortion of the output of the FM demodulator, and adjust the Varicap Bias adjustment on the FMO (adjustment A) for a minimum distortion reading.

   Note: Normally there are two setting of the Varicap Bias adjustment that will produce minimum distortion. Varicap bias should be adjusted to the setting that produces the lowest distortion.

   Readjust the VCO/MOD ADJ so that the voltmeter reads between 4.0 and 4.5 V.

   Repeat this procedure until the varicap bias is set for minimum distortion and the ØV level adjustment is between 4.0 and 4.5 V.

   Set the frequency on the distortion measurement set for 15 KHz and verify that the distortion is less than .15%.

Equipment Required [Test Equipment]

Spectrum Analyzer	HP8559B
Oscilloscope	TEK-465 or Equiv.
Multimeter	Data Precision 238

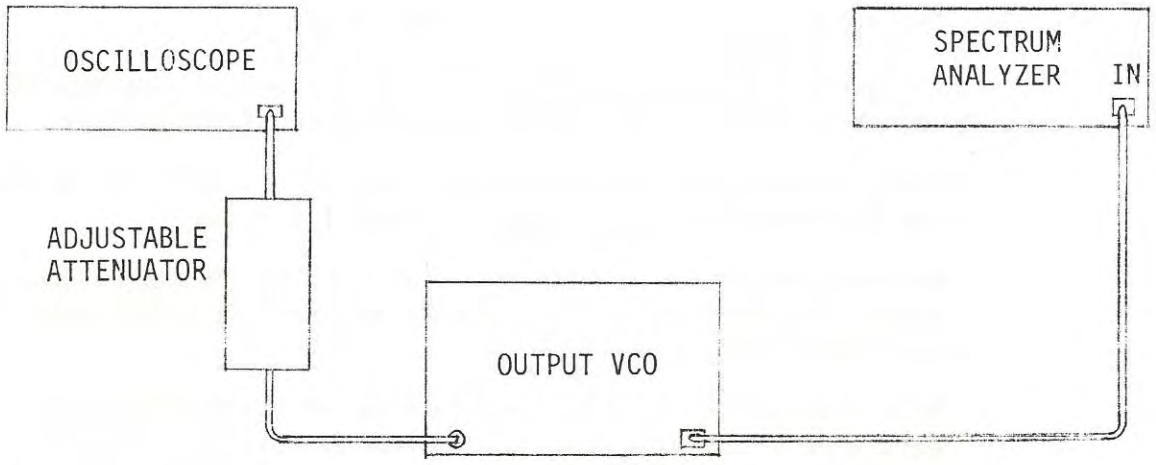


Fig A5-17 Output VCO Test set-up
6608-3374 A2-A4

Procedure:

1. To test the output VCO the sampling phase lock loop upconverter and the VCO/Modulator must be operational.

2. Disconnect the coax that connects the output VCO to the 1 watt driver. Connect a piece of coax to the output of the output VCO. Connect setup together as shown in Fig A5-17. Adjust the attenuator for -20 dB attenuation.

3. Disconnect the VCO/Modulator signal. With the oscilloscope observe ØV pin. Adjust R16 for a symetrical waveform. Reconnect the VCO/Modulator.

4. Connect the multimeter to the ØV pin and adjust the tune for +6 Vdc at this point.

5. The output level should be +17 dBm $\pm$ 2dB.

   Using the multimeter, monitor V T.P. and adjust the VCO/MOD adjust so that the voltmeter reads between 4.0 and 4.5V.

   Using the distortion measurement set, verify that the output of the FM demodulator is between 1.0 and 1.5 V rms.

   Measure the distortion of the output of the FM demodulator, and adjust the Varicap Bias adjustment on the FMO (adjustment A) for a minimum distortion reading.

   Note: Normally there are two setting of the Varicap Bias adjustment that will produce minimum distortion. Varicap bias should be adjusted to the setting that produces the lowest distortion.

   Readjust the VCO/MOD ADJ so that the voltmeter reads between 4.0 and 4.5 V.

   Repeat this procedure until the varicap bias is set for minimum distortion and the ØV level adjustment is between 4.0 and 4.5 V.

   Set the frequency on the distortion measurement set for 15 KHz and verify that the distortion is less than .15%.

Equipment Required

Spectrum Analyzer	HP8559B
Attenuator (30 dB)	Sierra 661A-30
Multimeter	Data Precision 238
Power Meter	HP435A

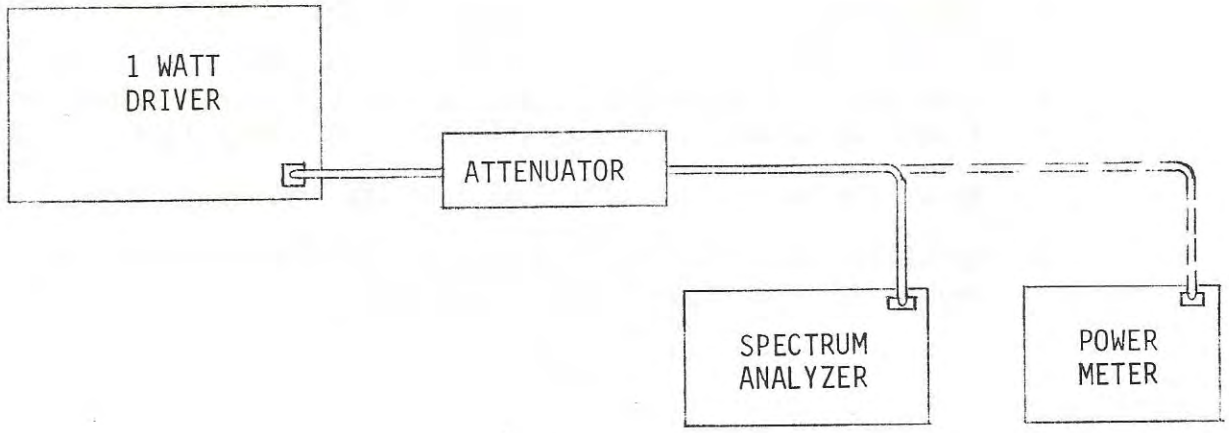


Fig A5-18 Test set-up for 1 watt driver
6608-3378 A2-A5

Procedure:

1. To test the 1 Watt driver the output VCO, sampling phase lock loop up converter and VCO/Modulator must be operational. Connect the equipment as shown in Fig. A5-18.

2. Turn on the RF power switch on the front panel of the 8300. Adjust C13 and C15 for max. power output as observed on the spectrum analyzer.

3. Disconnect the spectrum analyzer and connect the output to the power meter. The output level should be +31 dBm ±1.5 dB.

4. Readjust the output VCO tune capacitor for +6 Vdc on the Ø V T.P.

5. Measure the 1 watt level T.P. with the multimeter. Make a note of this level for future reference.

6. Disconnect the attenuator from the 1 watt driver. Adjust R9 for a maximum current of 110 mA into the +12S supply line.

7. Adjust R3 for maximum of 120 mA into the +12 supply line.

8. Reconnect the attenuator and recheck the power output. It should still be above 1 watt or +30 dBm.

Equipment Required

Power Meter
30 dB Attn
Multimeter
Spectrum Analyzer

Data Precision 238
HP-8559B

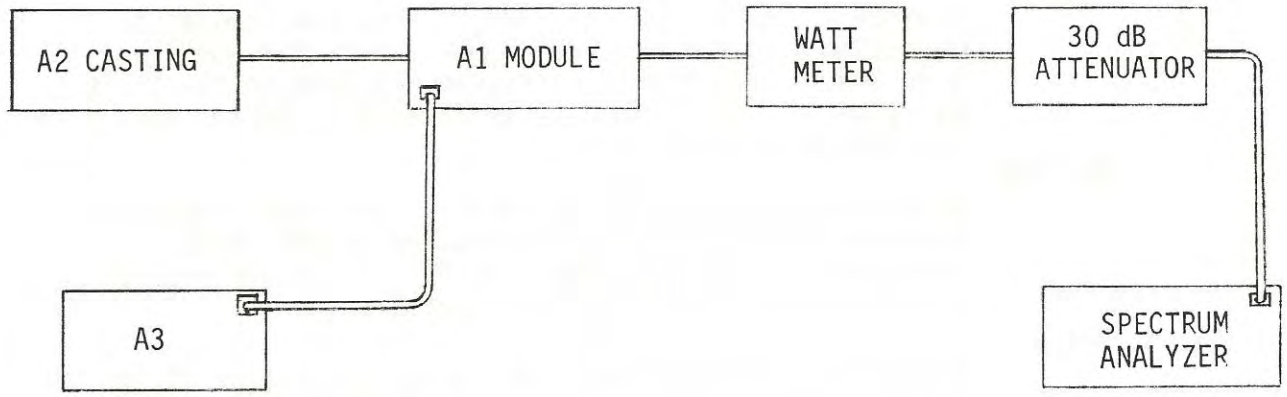


Fig A5-19 Test set-up for A1 Module

Procedure:

1. Set-up equipment as shown in Fig. A5-19. A2 casting must be operational for testing.
2. Adjust R64 on front panel board for +12 Vdc on P.A. Supply.
3. Adjust C1, C7, C11 for maximum power output. Observe output on spectrum analyzer for parasitic oscillations and spurs.
4. Using the multimeter in the current measuring position, check the current to the final amp.

Meter Bd. (6608-3395) A3

PRGM DEV

Program Deviation Adjust, (R23). Sets the transmitter deviation of the composite signal. Normal input level is 1.24 Vrms. This should correspond to 100% on the front panel meter. R23 should be adjusted for ±50 kHz deviation for 100% modulation.

MUX DEV

Multiplex Deviation Adjust, (R39). Sets the transmitter multplex deviation. 100% indication on the front panel meter, on either MUX 1 or MUX 2, should provide ±12 kHz deviation of the main carrier.

MUX 1

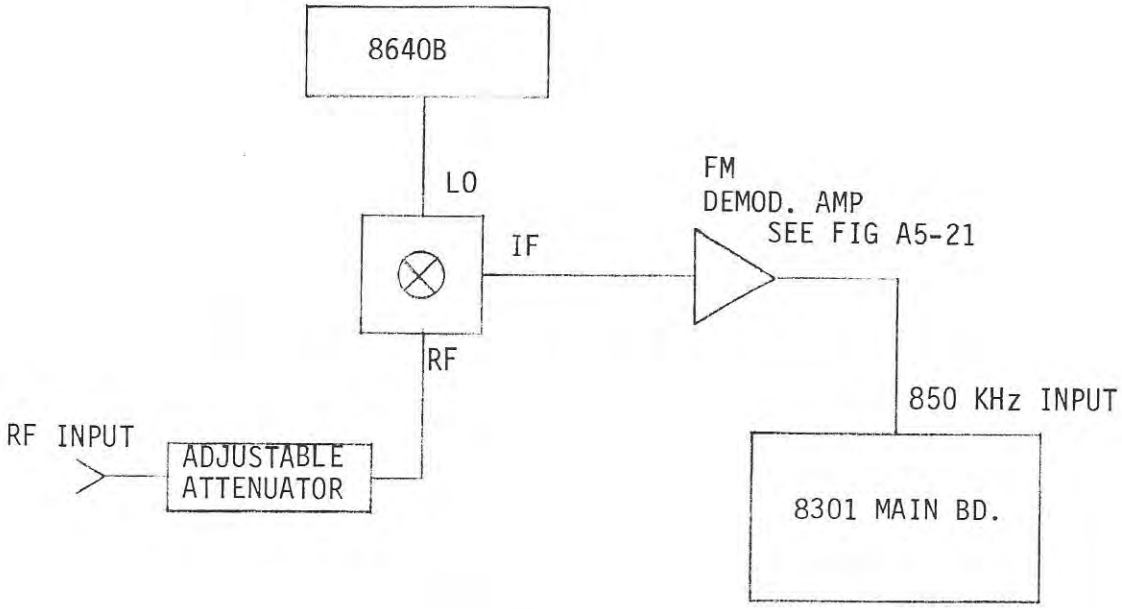
Multiplex 1 (R32) Adjusts the input sensitivity of the MUX 1 input. Maximum sensitivity of .54 Vrms will be 100% or ±12 kHz deviation.

MUX 2

Multiplex 2 (R31) adjusts the input sensitivity of the MUX 2 input. Maximum sensitivity of .54 Vrms will be 100% or ±12 kHz deviation.

8300 Bargraph Display 6608-3348 A4

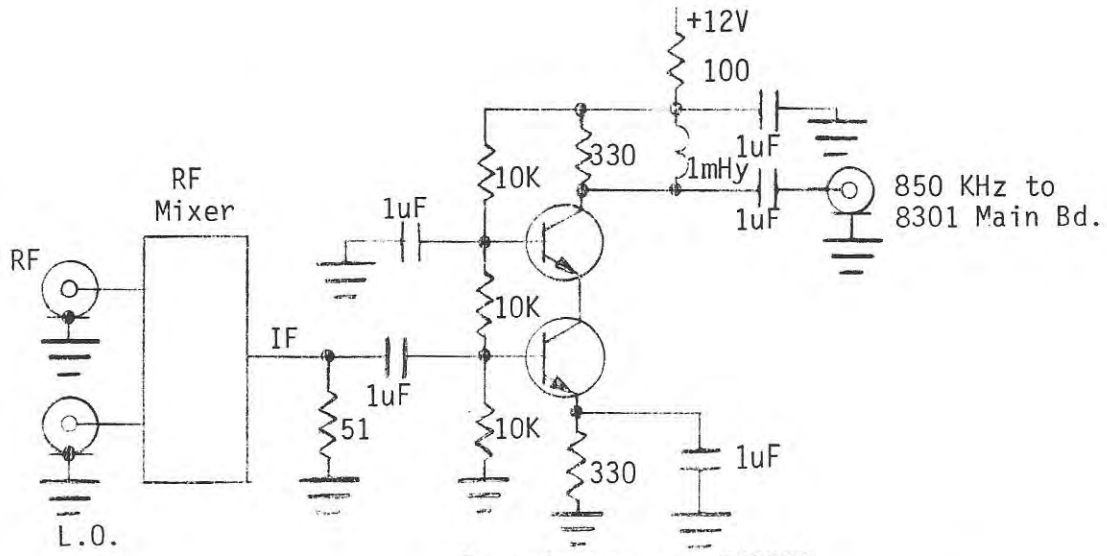
1. Inject a level of 1.24 Vrms into the composite input. This should give a level at 100% on the meter. Increase the level to 120% modulation.
2. Adjust R8 for a full scale indicator on the bargraph display.
3. Reduce the level to 70%. Adjust R2 for a minimum indication on the bargraph display.



8301 Front Panel Controls

RF Gain	Hi
IB BW	Wide
METER SELECT	PGM

Figure A5-20 FM Demodulator Setup



Transistors are 2N2222
All Capacitors are 1 uF monolithic ceramic
Resistors are 1/4W carbon composition 5

Figure A5-21
FM DEMOD AMP

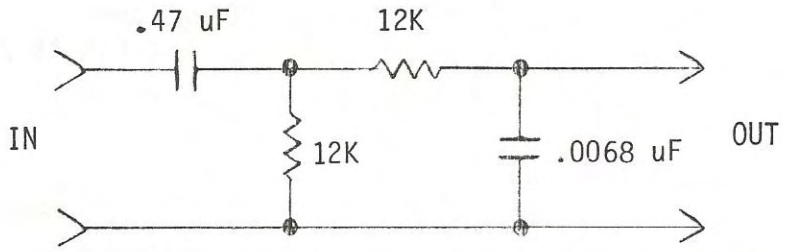


Figure A5-22. 75 Us de-emphasis network.

PART B

P/N 5004-8300
REVISION G
DATE 3-15-88
EQUIPMENT SERIAL NO. _____
SHIPMENT DATE _____

T F T

MODEL 8300 STL TRANSMITTER

PART B

TFT, INC.
3090 Oakmead Village Drive
Santa Clara, CA 95051
TEL (408) 727-7272 TWX 910-338-0584
FAX (408) 727-5942

PART B

Model 8300

950 MHz Transmitter

TABLE OF CONTENTS

DWG NO.

SECTION B 6 DIAGRAMS

SECTION B1

GENERAL INFORMATION

B1.1 General Description

The TFT 8300 Series STL Transmitters are for use at the studio site in an STL System. Each generates a frequency-synthesized carrier, using crystal-controlled phase-locked loops. Program audio and two additional subcarriers can frequency-modulate the carrier. RF power output is adjustable. Built-in protection circuits shut down the transmitter in case of synthesizer lock failure.

Two transmitters can be used with an optional Model 7770 Transmitter Automatic Changeover unit to provide automatic transfer to the standby in case of transmitter failure.

All of the transmitters are 5-1/4" high and mount in a standard 19-inch relay rack.

Transmitter

RF Power Output	4 Watts minimum 14 Watts maximum
RF Output Connector	Type N Female, 50 ohms
Deviation for 100% Modulation	±50 kHz
Frequency Stability	Better than .0001%, 0°C to 50°C
Spurious and Harmonic Emmission	60 dB or more below carrier level
Modulation Capability	One Stereo Composite Program and Two Subcarrier Channels
Modulation Inputs	Composite: 3.5V peak-to-peak. 10K ohms balanced and unbalanced, BNC and terminal strip Multiplex: 1.5V peak-to-peak, 10K ohms BNC, (2 eacn), frequency range 130 to 300 kHz
Power Source	115/230 VAC ± 10%, 50/60 Hz, 80 Watts 24 VDC optional
Monitoring Capability	One 3 1/2" analog meter for monitoring power output power supply, bias voltages, multiplex and program modulation, LED bargraph for monitoring 70 to 120% program channel modulation

B1.2 Specifications

Frequency Range (MHz)	940-960
RF Power Output (watts, max)	14 w
Output Connector	50 ohm Type N Female
Frequency Stability (ppm/yr)	±1
Frequency Accuracy:	
0°C to +50°C.	±0.0001%
Spurious Signal Suppression:	
Non-Harmonically Related (dB)	≥-65
Harmonically Related (dB)	≥-65
AM Noise (dB below carrier)	≥-65
Freq. Dev. for 100% Mod:	
Composite & Monaural (kHz)	±50
Multiplex Channels (kHz)	±12
Modulation Input Levels: *	
Composite & Monaural (V rms)	1.24
Multiplex (V rms)	0.53
AC Line Power (watts) **	70
Operating Temperature Range (°C)	-10 to +50
Dimensions:	
Height	5.25" (13.3 cm)
Width	19" (48.3 cm)
Depth	13" (33 cm)
Weight (pounds)	29
(kilograms)	13.1

---

* 10 k ohm imput.
** 120/240 VAC, 50-60 Hz.

SECTION B4

THEORY OF OPERATION

B4.1 General

The Model 8300 Transmitter uses a triple phase-locked loop (PLL) system to develop a frequency synthesized carrier output in the 940-960 MHz band. The carrier can be frequency modulated with a composite audio signal plus two multiplex signals for program or control use. Specifications will be found in Section A1.2.

B4.2 Block Diagram Discussion (Figure B1)

The transmitter carrier frequency, in the frequency range of 940 to 960 MHz, is generated by a voltage-controlled oscillator (VCO) on the Output VCO Board. Its output is amplified by the 1-Watt Driver, which drives the 12-Watt Power Amplifier. The RF output can be turned on and off by switching the dc voltage to the 1-Watt Driver. Output power is adjusted by varying the dc operating voltage to the Power Amplifier.

The frequency of the VCO is controlled by a phase-locked loop (PLL) in which a sample of the VCO output is downconverted by mixing it with a 886.5-MHz LO signal from the Sampling Phase-Locked Loop Board. This signal, in the frequency range of 53.5 to 73.5 MHz, is compared in the phase detector with a frequency derived from a 5-MHz crystal oscillator on the VCO to its assigned frequency.

The LO signal for the mixer on the VCO Board is generated on the Sampling Phase Locked Loop Board by a VCO in a PLL, the reference frequency for which is supplied by an 87.65 MHz crystal oscillator and a X10 multiplier circuit using a step recovery diode.

The reference frequency for the phase detector on the Output VCO Board comes from a VCO on the VCO/Modulator Board. This VCO is in a PLL with a phase detector operating at 500 Hz for 50 kHz steps (or 625 Hz for carrier frequencies spaced in 62.5-kHz steps in the 940-960 MHz band). Audio modulation from the Audio/Meter Board is applied to the VCO on the VCO/Modulator Board to frequency modulate the reference input to the Output VCO Board and thus the transmitter carrier.

Inputs from all three PLLs are supplied to an alarm circuit on the Sampling Phase Locked Loop Board to turn on the front panel SYSTEM LOCKED LED and turn off the RF power output if any of these loops becomes unlocked. The alarm circuit is also triggered by a failure of the crystal oscillator on the VCO Synthesizer Board.

Power for all modules in the casting (Assembly A2) and for the Audio/Meter Board comes from a supply on the Audio/Meter Board. Power for the Power Amplifier comes from a supply on the Power Amplifier Assembly A1.

B.4.3 Schematic Diagram Discussion

B4.3.1 Power Amplifier Assembly A1 (Figure B2)

This assembly contains both Power Amplifier and the Power Supply. The power supply circuit is shown at the top of Figure B2. The power transformer and rectifier mounted on the chassis furnish +unregulated DC V to pin 1 of J1. This is regulated by U1 to +12V and fed to the 1 Watt Driver, which draws about 750 mA.

The unregulated voltage at J1 pin 1 is also applied to the high-current (3.5 A) supply consisting of regulator U2 and shunt transistor Q3. R2 limits current to a safe value in case the supply output is short circuited. Q1 and Q2 make up a switching circuit, controlled by the front-panel RF POWER switch, for turning on and off the power supply and thus the 12 W Amplifier. The switching circuit also controls the power to some of the phase-lock circuitry.

The voltage out of the high-current supply is adjusted by means of the front-panel RF POWER OUTPUT ADJ control, which is a 100K ohm variable resistor on the Audio/Meter Board that is connected across pins 1 and 2 of J2 on the Power Supply. When the resistance across pins 1 and 2 is 0 ohms, the power supply output if 5V; when the resistance is approximately 22K ohms, the output is 14V.

The circuit of the 12W Power Amplifier is shown at the bottom of Figure B2. The input from the 1W Driver at J1 goes to amplifier Q1 through a mathcing network composed of C1 and some printed inductors. Q1 develops approximately 4 W. Its collector is matched into the emitter of amplifier Q2 through the matching network consisting of C5, L2, C6, and C7. Q2 is matched into a 50-ohm low-pass filter and into a printed circuit directional coupler which, with diodes CR1 and CR2, provides dc voltages proportional to forward and reflected power, respectively. The RF output at J2 is 12 W nominal at 50 ohms. Power output can be adjusted by means of the front-panel RF ADJ control as described in the preceding paragraph.

B.4.3.2 Sampling Phase-Locked Loop A2A1

Q7, Y1, and associated components make up a crystal oscillator operating at 87.65 MHz. Emitter follower Q6 and amplifier Q5 feed the crystal oscillator output into the primary of transformer T1. T1 drives step recovery diode CR6 in a X10 multiplier circuit. The 876.5-MHz multiplier output is applied to one input of balanced mixer CR4/CR5. The other input to the mixer comes from voltage controlled oscillator Q4, whose nominal frequency is also 876.5 MHz. If there is a difference in the two mixer input frequencies or phase, a dc voltage is produced across the mixer's resistive load. This voltage is fed through adjustment potentiometer R28 and loop amplifier U1-7 to varicap CR3 in the tuned circuit of Q4, tuning Q4 back into lock. The 886.5-MHz output of Q4 is delivered to mixer U1 on the Output VCO Board. The output is also rectified by CR8 so that its level can be checked at TP1. The loop error voltage can be monitored at the LO test point shown at the left side

B4.3.2 Continued

loop error voltage can be monitored at the LO test point shown at the left side of the schematic.

U1-1, Q1, Q2, Q3, and Q8, and associated components make up an unlocked-loop alarm and power-turnoff circuit. Pin 3 of comparator U1-1 is biased to approximately 3.5V. In the absence of an alarm input, pin 2 of U1 is at less than 3.5V and the comparator output at pin 1 will be +12V. This turns off Q1 and the front-panel SYSTEM UNLOCKED LED in its collector circuit. The output of U1-1 also turns on Q2 and Q3 to supply +12V to the 1 W Driver and thus turn on the RF output of the transmitter.

If the phase-locked loop on the Sampling Phase Lock Loop Board becomes unlocked, the sweeping of the dc error voltage at pin 7 of U1 will be coupled through C3 and rectified by CR2 to produce a positive voltage at pin 2 of U1. Likewise, if the phase-locked loop on the VCO Synthesizer Board or the Output VCO Board becomes unlocked, a positive voltage will be supplied to pin 2 of U1. Any of these conditions will cause U1-1 to output -12V, which will turn on Q1 and the SYSTEM UNLOCKED LED. It will also turn off Q2 and Q3 to remove operating voltage from the 1 W Driver and turn off the Rf output of the transmitter.

When the front-panel power switch is in the STANDBY position, it supplies a positive voltage through J3-1 and J2-13 of the Audio/Meter Board to the base of Q8 on the Sampling Phase Lock Loop Board. Q8 then turns off Q2 and Q3 to remove the +12V supply from the 1 W Driver. In the POWER ON position, the front-panel switch supplies 0 V to reverse the operation and enable RF output.

B4.3.3 VCO/Modulator A2A2 (Figure B4)

The VCO for this module is common-gate FET Q1. Its tuned circuit consists of a printed inductor connected to the drain of Q1 together with associated capacitors. A dc tuning voltage from the phase-locked loop in the Synthesizer module comes in at E4 and is applied to varicap CR2 to keep the VCO on frequency. C15 tunes the Q1 tank circuit so that it is within the control range of the phase-locked loop.

The VCO output is amplified by Q2 and Q3 and delivered to the Output VCO module via E2. The VCO output is also fed through voltage divider R2/R3 to the phase-locked loop on the Synthesizer module.

The VCO is frequency modulated by an audio signal (MODULATION IN) from the Audio/Meter Board which is applied to varicap CR1 in the tuned circuit of Q1. R14 adjusts the bias on CR1 so that the varicap is operating in its linear range and thus producing minimum distortion.

B4.3.4 VCO Synthesizer Module A2A3 (Figure B5)

This module is the phase-locked loop for the VCO/Modulator. A sample of the VCO/Modulator output, which is a frequency in the range of 53.5 to 73.5 MHz, is divided by 100 in U1. Q1 and associated components drop the

B4.3.4 Continued

+12V supply voltage to +5V to operate U1. The TTL-level output of U1 is amplified by Q2 to a CMOS level and applied to the divide-by-N dividers U2 and U3. The divider circuits in U2 and U3 are set to give a value of N that will produce an input to the phase comparator in U3 of 500 Hz for transmitter carrier frequencies that are spaced 50 kHz apart in the 940-960 mHz band, or 625 Hz for carrier frequencies spaced 62.5 kHz apart. The value of N for the divide-by-N dividers is determined by the settings of the eight switches in SW1 and the four switches in SW2. A closed (grounded) switch is a 0 and an open switch is the number shown on the schematic. For example, if the required value of N is 1200, the 1024, 128, 32, and 16 switches would be open and all other switches closed.

The reference input to the phase comparator in U3 comes from the 5-MHz crystal oscillator consisting of crystal Y1, NAND gate U6-10 and sent to the casting, where frequency can be measured. The reference frequency is buffered again by U6-3 and fed to divide-by-N counter U5. The input will be divided by 100 if pins 5 and 12 are jumpered to +12V and pin 11 is jumpered to ground; this is the setup for transmitter carriers spaced by 50 kHz. For transmitter carriers spaced by 62.5 kHz, pins 5 and 12 are jumpered to ground and pin 11 is jumpered to +12V to divide the input by 80.

The output of U5 is fed to U3, where it is divided by 100 in a fixed divider. The output of this divider is the reference input to the phase comparator in U3. The ouput of the phase comparator, which is the loop error voltage, is taken from pin 13 of U3, amplified by U4, and sent to the VCO Modulator to tune the VCO.

The VCO Synthesizer Board provides two inputs to the alarm circuit on the Sampling Phase Locked Loop Board. One of these generates an alarm if the VCO Modulator phase locked loop becomes unlocked. The other generates an alarm if the crystal oscillator does not operate. Q3 is normally turned off by its positive base bias. However, if the PLL of which U3 is a part becomes unlocked, pin 12 of U3 will go low and turn Q3 on; Q3 then delivers a positive input to the alarm circuit on the Sampling Phase Locked Loop Board which lights the front-panel SYSTEM UNLOCKED LED and turns off the transmitter output.

When the output from crystal oscillator buffer U6-3 is normal, it will be rectified by CR2 and inverted by U6-4 to deliver a positive voltage to the base of Q3. If, however, the crystal oscillator fails, the +12V through pull-up resistor R28 will be inverted by U6-4 to turn on Q3 and deliver a positive alarm signal to the Sampling Phase Locked Loop Board.

B4.3.5 Output VCO Module A2A4 (Figure B6)

Q7 is the VCO, operating on a frequency in the range of 940 to 960 MHz. It supplies approximately 50 mW to the 1 W Driver, and also furnishes an input to a PLL consisting of mixer U1, amplifier Q5/Q6, phase comparator U2, amplifier Q4/Q3, amplifier Q1, and varicap CR4. U1 mixes the 940-960 MHz signal with an 876.5-MHz input from the Sampling Phase Lock module. The resulting frequency in the range of 53.5 to 73.5 MHz is low-pass filtered by L2 and C3, amplified by Q5/Q6, and fed to phase comparator U2.

B4.3.5 Continued

The VCO Modulator Board outputs the identical frequency derived from a crystal oscillator on the VCO Synthesizer Board. If there is a difference in frequency or phase between the two inputs to U2, it will develop a dc output which is amplified by differential amplifier Q3/Q4, and by Q1/Q2 which furnishes an error voltage to varicap CR4 in the tuned circuit of Q7. When the loop is out of lock, the circuitry of Q1 through Q4 will sweep the eror voltage from -12V to +12V until the loop locks again. R16 adjusts the symmetry.

When the loop is out of lock, the sweeping voltage at the collectors of Q1 and Q2 is coupled by C13 to CR3. The resulting dc voltage is sent to the alarm circuit on the Sampling Phase Lock Board to turn on the alarm circuit on the Sampling Phase Lock Board to turn on the front-panel SYSTEM UNLOCKED LED and to turn off the transmitter output.

B4.3.6 1-Watt Driver A2A5 (Figure B7)

The output from the VCO Output module, in the range of 940 to 960 MHz, is applied to the base of amplifier Q2 through a stripline matching network. The 1W output of Q1 is matched to a transmission line which goes to the 12W Amplifier Module.

Transistors Q5, Q6, and Q7 provide overcurrent protection for Q2, limiting the collector current to approximately 100 mA in case of an open load on Q2. R3 is adjusted so that the collector current of Q1 can never exceed 200 mA.

The loop consisting of CR1 and associated capacitors provides a dc output that is proportional to the RF output of the 1W Driver. This dc output goes through a metering circuit to the front-panel meter so that the RF output level can be monitored.

There are two +12V inputs to the 1W Driver. One is switched +12V from the Sampling Phase Lock module that is applied to Q2 through its current-limiting circuit. This supply comes from a circuit on the Sampling Phase Lock Board that turns off the +12V and thus the transmitter RF output when it senses an out-of-lock condition. The other +12V is the regular supply from the Output VCO module.

B4.3.7 Audio/Meter Board A3 (Figure B8)

This board does all the audio processing for the transmitter, combining the audio signals for the VCO/Modulator Board. It also contains the metering circuitry.

The audio input at the rear panel is brought onto the Audio/Meter Board at J6. This input can be balanced (±) audio, or it can be composite audio if J6-3 is grounded. The input is applied to the differential amplifier consisting of U1, U2, and U3, and fed through switch S1 to U4. The switch is placed in the position shown on the schematic for composite audio. When monaural audio is used, the switch is placed in the opposite position which

B4.3.7 Continued

provides 75-microsecond preemphasis.

From U4, the audio goes into summing amplifier U5, which drives the VCO/Modulator. The MUX 1 and MUX 2 inputs at pins 6 and 8 of J4 are fed through level adjust potentiometers R31 and R32 into summing amplifier U6 and then combined with the program audio in U5.

Levels are factory adjusted so that 1.24 V rms into the balanced input produces ±50 kHz deviation in the transmitter output frequency. A level of 0.53 V rms at either the MUX 1 or MUX 2 input will give a 100% indication on the front-panel meter (±12 KHz deviation).

When two subcarriers are being used, a jumper must be connected between terminals E4 and E5 on the board. This cuts the gain of U6 in half, so that both MUX 2 will indicate 100% on the meter for ±6 kHz deviation. The maximum deviation for the program signal plus all subcarriers must not exceed ±62 kHz.

The metering circuit consists of U8-1, U8-7, and associated components. U8-1 is a positive peak detector with a response that is flat beyond 200 kHz. U8-7 is the meter amplifier, which drives the front-panel meter through pins 3 and 6 of J3. Low-voltage ac for the meter light comes from a transformer on the chassis via pins 4 and 5 of J3.

Input to the metering circuit is via the front-panel multiple pushbutton switch S3. When the PRGM button is pressed, the program audio is selected. It can be flat or with preemphasis depending on the connection of the jumper at E2. When MUX 1 or MUX 2 is pressed, the signal at the MUX 1 or MUX 2 level adjust potentiometer is selected. When INT TP is pressed, the input comes from whichever one of the test points E7 through E13 is jumpered to E14. When -12V is pressed, a fraction of the -12V supply voltage, inverted by U7, is selected. When FWD PWR or REV PWR is pressed, the input from the forward power or reflected power directional coupler on the Power Amplifier is selected.

The front-panel RF PWR ADJ potentiometer (R64) is in the control circuit of regulator U2 on the Power Supply, as described in paragraph B4.3.1. U9 and Q1 constitute a power level sensing circuit. The dc input from the directional coupler on the Power Amplifier Assembly, which is proportional to RF power output, is compared in U9 with a reference voltage set by potentiometer R67. If the power level drops below the preset reference, Q1 is turned on , producting a TTL low at pin 1 of J4. Pins 1 through 4 of J4 go through the rear-panel REMOTE connector to an optional Model 7770 Transmitter Auto Changeover unit. A TTL low at pin 1 will cause the changeover unit to switch transmitters, provided the MANUAL/AUTO TRANSFER switch (S2) on the Audio/Meter Board is in the AUTO TRANSFER position.

The power supply consisting of bridge rectifier K2, regulator U10, and associated components furnishes regulated -12V to the casting (from B on the schematic) and to the Audio/Meter Board. A full-wave, high-current bridge rectifier mounted on the chassis supplies a positive input to U11, which

B4.3.7 Continued

regulates it to +12V for the casting (from A on the schematic) and for the Audio/Meter board.

B4.3.8 Bargraph Display (Figure B9)

The program audio from A3-J3-I3 is applied to active peak detector U1/CR1/C1. The resulting dc voltage, which is proportional to modulation percentage, is fed through amplifier U2-7 to the bargraph display (CR2). The circuit is calibrated by means of R8, which controls the gain of U2-7. The circuit consisting of U2-1, Q1, and Q2 provides a reference voltage for U1 and U2-7.

The bargraph display indicates modulation percentage within range of 70 to 120 percent.

SECTION B5

MAINTENANCE
STL TRANSMITTER

B5.1 General

Once installed, the TFT Series 8300 Studio Transmitter Link should require little maintenance. The units should be installed away from vaccuum tubes and other heat generating equipment.

B5.2 Access

Model 8300 Series STL Transmitter

To gain access to circuit assemblies and top-of-chassis components, remove to top cover. Assembly locations and interconnections are shown in Figure B10.

B5.3 Periodic Maintenance

Once installed, the only maintenance necessary is a periodic proof of performance check of the system to be assured of optimum operation.

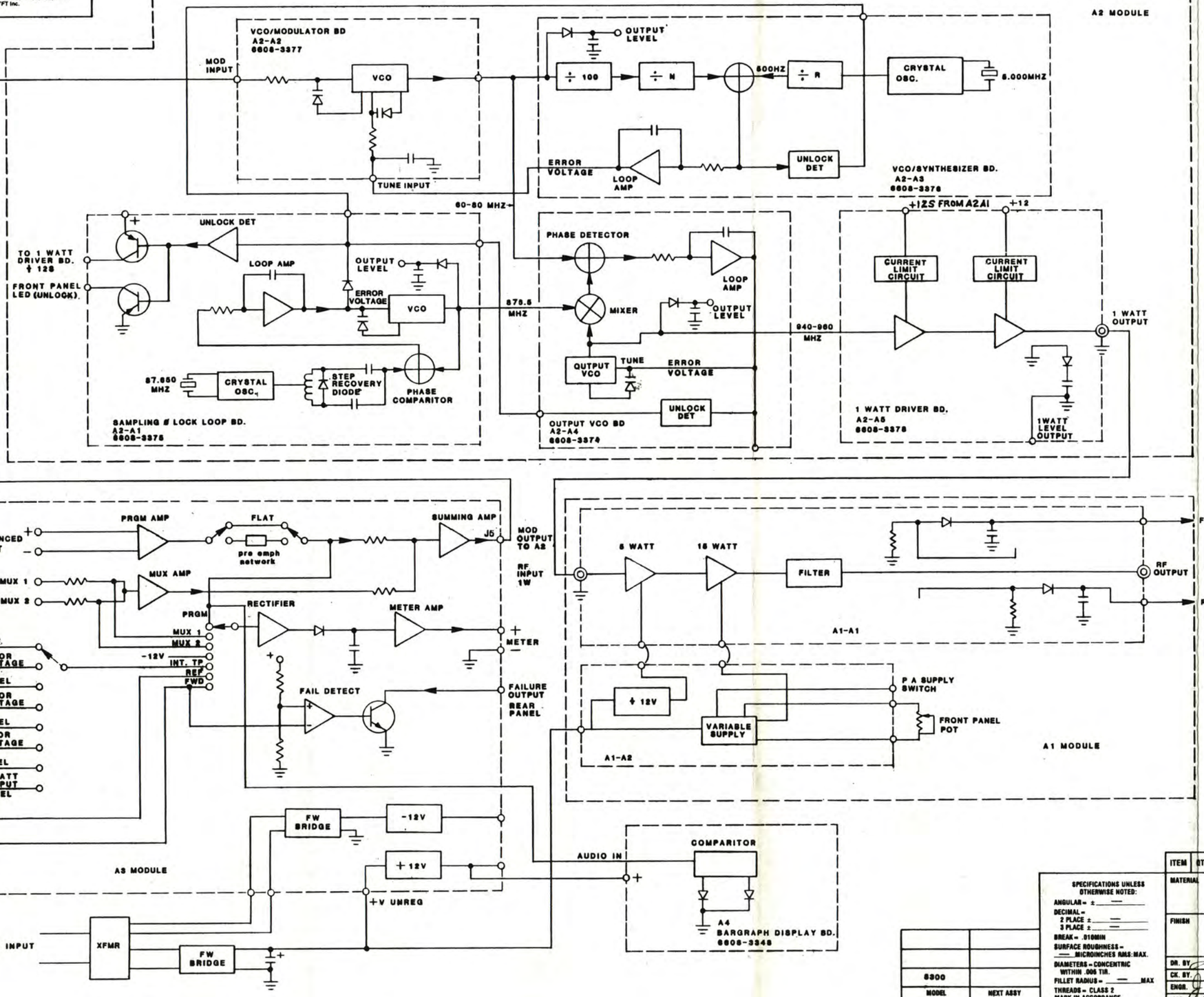
The performance of the STL transmitter can be easily and quickly checked at the front-panel multimeter. Following installation of the STL system, the operational front-panel meter readings for each position of the meter selector switch should be recorded. This gives a quick and accurate check of system performance by allowing a comparison of present operation to its operation when new. Gradually changing readings can be quickly spotted by this method and used to forstall developing problems.

Note

Whenever the transmitter is in operation with RF Power on, the RF Output must be terminated into a 50 ohm, 15W minimum load or the STL antenna. If operated unterminated for extended periods, the RF Power Amplifier can be damaged.

6600-2281

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	PROD. RELEASE	L.M.	10-12-83	
B	ADD "J5" IN A3 MODULE			
C	876.5MHz WAS 886.5MHz, 87.650MHz WAS 88.650MHz	KK	2-5-85	



8300	
MODEL	NEXT ASSY
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ± —
DECIMAL = 2 PLACE ± —, 3 PLACE ± —
BREAK = .010MIN
SURFACE ROUGHNESS = — MICROINCHES RMS MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = — — MAX
THREADS = CLASS 2 MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
MATERIAL			
FINISH			

TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584

BLOCK DIAGRAM
MODEL 8300

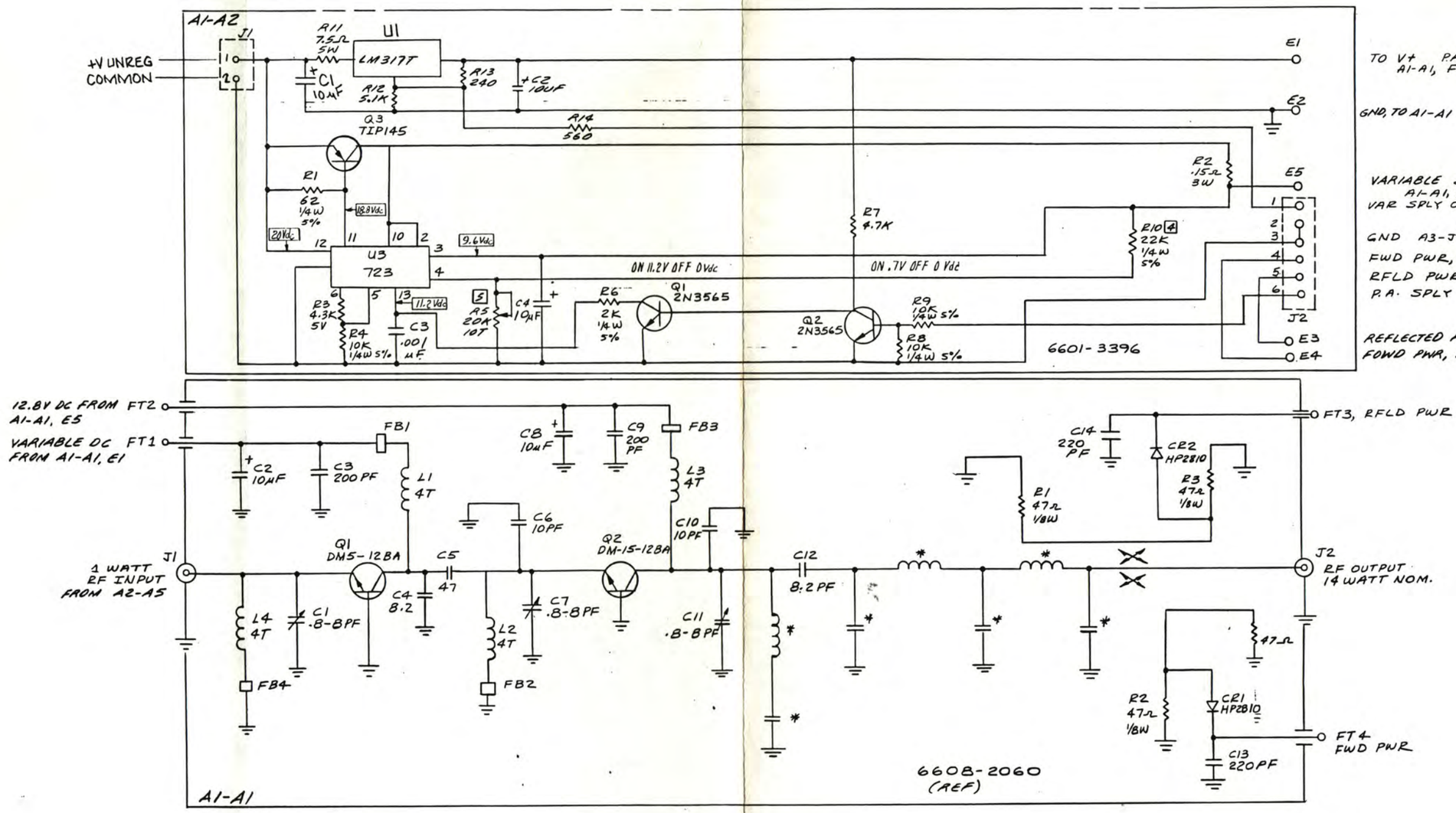
DR. BY	K. Muchie	10.5.83
CK. BY		
ENGR.		10/4/83
MFG.		7/7/84
Q.A.		7/16/84

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	D	6600-2281	C

SCALE — DO NOT SCALE PRINT SHEET 1 OF 1

DWG. NO. | SH | REV.

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	PROD. RELEASE			
B	REVISED PER ECO 1620	KC	4-13-84	
C	REF DWG, FIELD F.O, ADD "J1"	KC	10-23-84	
D	REVISED PER ECO 1678	KC	5-9-85	
E	REVISED PER ECO 1698	KC	11-7-85	
F	REVISED PER ECO 1728	ERK	12-29-87	



7. ⬭ = A.C. VOLTAGE
6. ▭ = D.C. VOLTAGE

5 ADJUST R5 FOR 12.8V DC OUTPUT AT E5

4 FACTORY SELECT VALUE, TYPICAL VALUE SHOWN

3. OUTPUT PWR CONTROLLED BY VARYING SUPPLY VOLTAGE TO A1-A1-Q2

2. L1 L2 L3 ARE 4T OF 20AWG WIRE WITH .30 I.D.

1. * DENOTES PRINTED COMPONENTS

NOTES: UNLESS OTHERWISE SPECIFIED

MODEL	NEXT ASSY
8300	5102-3384
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ± —
DECIMAL = 2 PLACE ± — 3 PLACE ± —
BREAK = .010MIN
SURFACE ROUGHNESS = — MICROINCHES RMS MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = — MAX
THREADS = CLASS 2 MARK IN ACCORDANCE WITH TFT SPEC 5300-1068

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
MATERIAL			
FINISH			

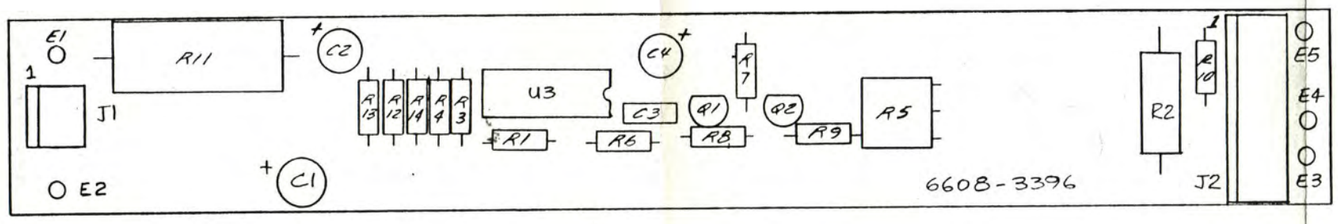
TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584

SCHEMATIC- A1 POWER SUPPLY

DR. BY.	D. H		
CK. BY.			
ENGR.		12/1/87	
MFG.		7/13/84	
Q.A.		7/14/84	
		7/14/84	

CODE IDENT NO. | SIZE D | DRAWING NO. 6601-3396 | REV. F | SCALE — | DO NOT SCALE PRINT | SHEET 1 OF 1

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	PROD. RELEASE	[illegible]	9-1-83	
B	REVISED PER ECO 1620	KR	4-13-84	
C	REVISED PER ECO 1659	KR	10-29-84	
D	REVISED PER ECO 1678	KR	5-15-85	



SCHEMATIC 6601-3396
MATL LIST 6608-3396

MODEL	NEXT ASSY
8300	5102-3384
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ±
DECIMAL = — 2 PLACE ± — 3 PLACE ±
BREAK = .010MIN
SURFACE ROUGHNESS = — MICROINCHES RMS: MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = MAX
THREADS = CLASS 2
MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
MATERIAL			
FINISH			

DR. BY.	[signature]	9-30-83
CK. BY.		
ENGR.	[signature]	7/3/84
MFG.	[signature]	7/3/84
Q.A.	[signature]	7/16/84

TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584

PCB ASSEMBLY-
A1 POWER SUPPLY

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	C	6608-3396	D

SCALE FULL | DO NOT SCALE PRINT | SHEET 1 OF 1

Model 8300, 77008

POWER SUPPLY

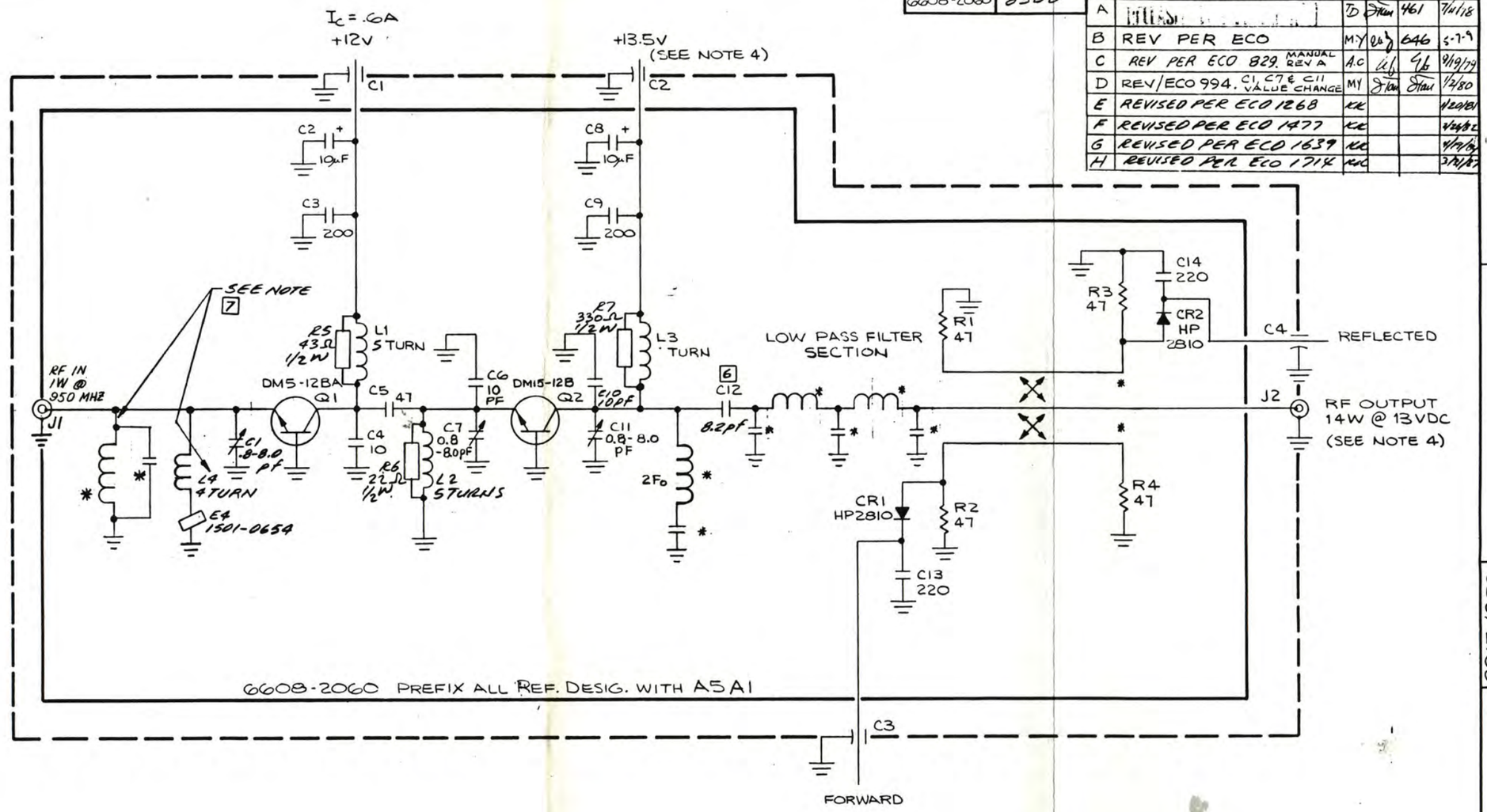
Assembly #6608-3396
Rev.D

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
C1	CAP ELECT 25V 10MF	3	1010-0099
C2	CAP ELECT 25V 10MF		1010-0099
C3	CAP CER CK05 .001MF	1	1015-0010
C4	CAP ELECT 25V 10MF		1010-0099
J1	CONN MOLEX 2 PIN	1	2250-6002
J2	CONN MOLEX 6 PIN	1	2250-6606
Q1	TRANSISTOR 2N3565	2	1271-3565
Q2	TRANSISTOR 2N3565		1271-3565
Q3	NOT USED		
R1	RES CAR COMP 1/4W 5% 62	1	1065-0062
R2	RES WIRE WOUND 1/4W 5% .15 OHM	1	1068-0016
R3	RES CAR COMP 1/4W 5% 10K	3	1065-1002
R4	RES CAP COMP 1/4W 5% 4.3K	1	1065-4301
R5	RES VAR PC MT 20K 10T	1	1069-2002
R6	RES CAR COMP 1/4W 5% 2K	1	1065-2001
R7	RES CAR COMP 1/4W 5% 4.7K	1	1065-4701
R8	RES CAR COMP 1/4W 5% 10K		1065-1002
R9	RES CAR COMP 1/4W 5% 10K	1	1065-1002
R10	RES CAR COMP 1/4W 5% 22K	1	1065-2202
R11	RES WW 5W 10% 7.5 OHM	1	1068-0007
R12	RES CAR COMP 1/4W 5% 5.1K	1	1065-5101
R13	RES CAR COMP 1/4W 5% 240	1	1065-0240
R14	RES CAR COMP 1/4W 5% 560	1	1065-0560
U1	NOT USED		
U2	NOT USED		
U3	IC LM723	1	1100-0723
	IC SOCKET 14 PIN	1	2250-1014
	PCB	1	1600-3396
	SOLID PINS	5	2140-0071

NEXT ASSY	USED ON
6608-2060	8300

REVISIONS

SYM	DESCRIPTION	DR	CHK	AUTH	DATE
A	[illegible]	TD	Stan	461	7/11/78
B	REV PER ECO	MY	[illegible]	646	5-7-9
C	REV PER ECO 829. MANUAL REV A	AC	[illegible]	[illegible]	8/19/79
D	REV/ECO 994. C1, C7 & C11 VALUE CHANGE	MY	Stan	Stan	1/4/80
E	REVISED PER ECO 1268	KK			4/29/81
F	REVISED PER ECO 1477	KK			4/4/82
G	REVISED PER ECO 1639	KK			4/19/83
H	REVISED PER ECO 1714	KK			3/21/84



7 CUT TRACE ON PCB FOR A MODEL 8300 AS NOTED. COMPONENTS E4 & L4 USED ON MODEL 8300 ONLY

6 C12 IS FACTORY SELECT VALUE NOMINAL VALUE SHOWN

5. * IND. COMP. ETCHED ON PCB.

4. OUTPUT PWR TO BE CONTROLLED BY VARYING SUPPLY VOLTAGE. MAXIMUM AVAILABLE SUPPLY VOLTAGE IS +13.5V

3. L1, L2, L3 ARE 5 TURNS OF 22 GAUGE SOLID WIRE WRAPPED AROUND A ½ W RESISTOR.

2. CAPACITOR VALUES ARE IN PICOFARADS

1. RESISTOR VALUES ARE IN OHMS, 1/8W, 5%, CAR. COMP.

NOTES, UNLESS OTHERWISE SPECIFIED;

ITEM NO.	EN NO.	PART NO.	DESCRIPTION	REF. DES.
QTY PER ASSY		LIST OF MATERIALS		

REMOVE ALL BURRS AND SHARP EDGES

TOLERANCES UNLESS OTHERWISE SPECIFIED
.XX ± ~ ANGULAR
.XXX ± ~ ± ~

DO NOT SCALE THIS PRINT

	DRAWN BY	DATE
	[illegible]	6-21
CHK. BY	Stan	7/11/78
PROJ. ENG.	[illegible]	4/4/79
MFG. ENG.	[illegible]	[illegible]
APPD.		
APPD.		
ECO NO.	461	

TFT TIME & FREQUENCY TECHNOLOGY INC.
3000 Olcott St., Santa Clara, California 95051
(408) 246-6365

TITLE: SCHEMATIC POWER AMPLIFIER A5, FIG 6.10

SIZE	DRAWING NO	REV
C	6601-2780	H

SCALE ~ SHT 1 OF 1

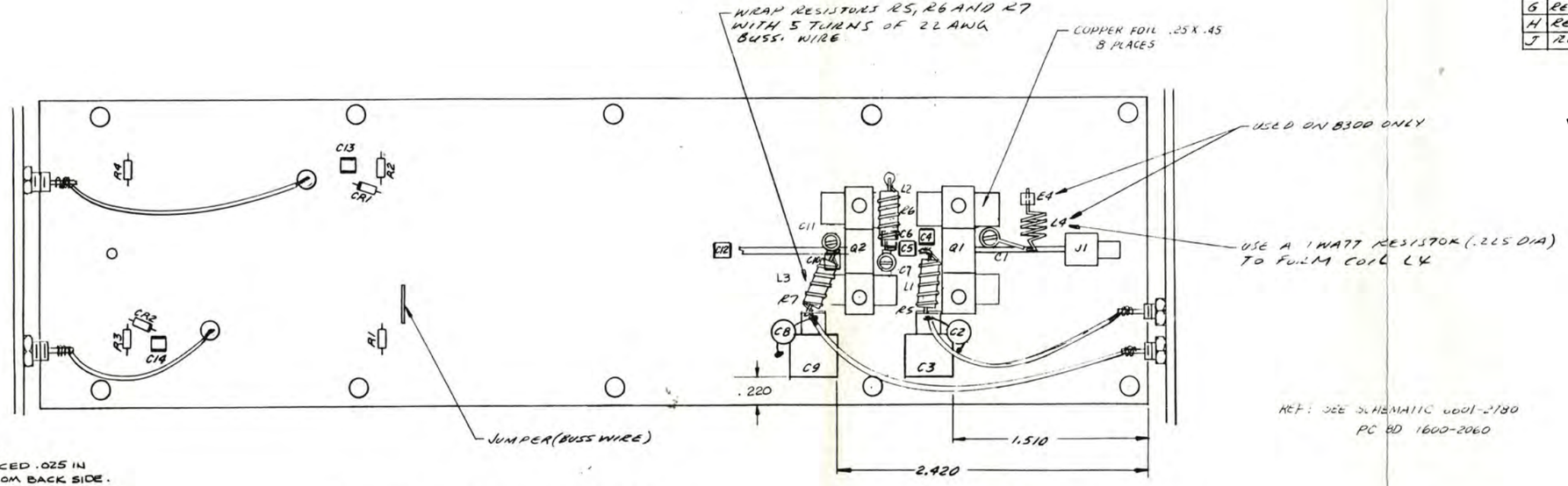
DWG. NO. 6601-2780

BISHOP GRAPHICS/ACCUPRESS
REORDER NO. A-6835

NEXT ASSY	USED ON
6608-2060	7300/9300

REVISIONS

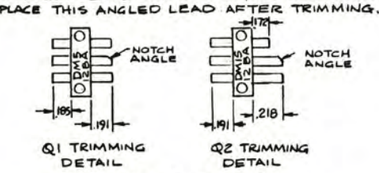
SYM	DESCRIPTION	DR	CHK	AUTH	DATE
B	REV./ECO 745	JT			4/4/79
C	REV PER ECO 871 (DRAWING REV'D A)	AC	LL	LL	7/11/79
D	REV/ECO 993	MM	JTau	JTau	11/2/80
E	REVISED PER ECO 1266	KK			11/19/81
F	REVISED PER ECO 1497	KK			4/14/83
G	REVISED PER ECO 1477	KK			4/28/83
H	REVISED PER ECO 1639	KK			11/9/83
J	REVISED PER ECO 1716	KK			4/4/84



REF: SEE SCHEMATIC 6001-2180
PC BD 1600-2060

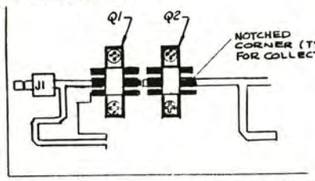
INSTALLATION NOTES:

1. INSTALL J1 ONTO PCB, SPACED .025 IN ABOVE BD AND SOLDER FROM BACK SIDE. CLIP OFF THE 5 LEADS TO APPROX. .025 IN.
2. ASSEMBLE HEAT SINK, P/N 2001-1940 ONTO CHASSIS, P/N 2001-1990.
3. SOLDER No. 14 TINNED BUSS WIRE, ½ IN LONG INTO THE CONNECTOR, P/N 2200-0006.
4. MOUNT CONNECTOR, P/N 2200-0006, ONTO CHASSIS P/N 2001-1990, USING SPACER P/N 2001-2020 AND MOUNTING HARDWARE: 4 EA SCREW P/N 2130-0075 AND NUT P/N 2111-0002
5. MOUNT PCB P/N 1600-2060 ONTO CHASSIS BUT DO NOT TIGHTEN DOWN ANY OF THE TEN 4-40 KEP NUTS, P/N 2111-0001
6. BEFORE MOUNTING TRANSISTORS Q1, P/N 1274-0512 AND Q2, P/N 1274-1512, TRIM LEADS AS SHOWN NOTE ANGLED LEAD FOR IDENTIFYING COLLECTOR. REPLACE THIS ANGLED LEAD AFTER TRIMMING.



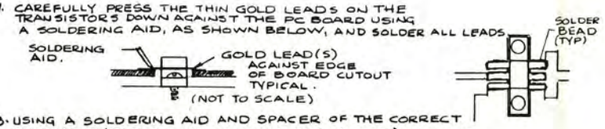
NOT TO SCALE!

AFTER LEAD TRIMMING, APPLY THIN COAT OF HEAT SINK COMPOUND EVENLY ON MTG SURFACES OF TRANSISTORS. USE 2 SCREWS, No. 2104-4068, PER TRANSISTOR, AS SHOWN. MOUNT LOOSELY.

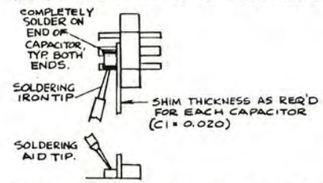


CENTER TRANSISTOR Q1 EVENLY IN RECTANGULAR HOLE, PAYING SPECIAL ATTENTION TO SEE THAT NOTCHED-CORNERED LEAD IS LOCATED AS SHOWN ABOVE. MOVE THE TRANSISTOR SLIGHTLY IF REQUIRED SO THAT CENTER LEADS ARE EVENLY PLACED ON THEIR RESPECTIVE TRACES. TIGHTEN SCREWS HOLDING Q1. TIGHTEN HEX NUTS HOLDING P.C. BOARD. REPEAT ABOVE FOR Q2. CHECK TO MAKE SURE OF ALIGNMENT.

7. CAREFULLY PRESS THE THIN GOLD LEADS ON THE TRANSISTORS DOWN AGAINST THE PC BOARD USING A SOLDERING AID, AS SHOWN BELOW, AND SOLDER ALL LEADS.

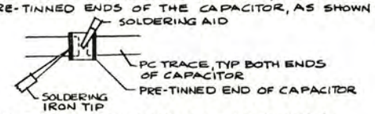


8. USING A SOLDERING AID AND SPACER OF THE CORRECT THICKNESS (SEE BOARD LOADING DWG ABOVE), SOLDER C1 IN PLACE WITH BODY EVENLY SPACED ON BOARD TRACES. CAPACITOR MUST BE FLUSH ON BOARD NO SOLDER VOIDS AT LEADS (ENDS) OF CAPACITORS.



REPEAT CAPACITOR SOLDERING STEP ABOVE FOR CAPACITORS C4, C6, C7, C10 AND C11.

9. USING A SOLDERING AID, HOLD CAPACITOR C5 FLUSH TO THE BOARD AND PLACED EVENLY WITH RESPECT TO TRACES, APPLY SOLDER IRON TO THE PRE-TINNED ENDS OF THE CAPACITOR, AS SHOWN BELOW.



SIMILARLY, SOLDER CAPACITORS C12, C13 AND C14.

10. SOLDER CAPACITORS C3 AND C9, AS SHOWN ON BD DWG, ABOVE

11. THE NEXT STEP IS TO INSTALL COILS L1, L2 AND L3. ALONG WITH CAPACITORS C2 AND C8.

INSERT + LEADS OF C2 AND C8 ONTO LARGE CAPACITORS C3 AND C9, USING THE HOLE ON THE LARGE CAP TERMINAL. DO NOT SOLDER!

TRIM THE LEAD AS SHORT AS PRACTICAL AND WRAP AROUND TERMINAL FOR GOOD MECHANICAL JOINT.

SOLDER NEGATIVE END OF C2 AND C8 TO GROUND PLANE, KEEPING LEAD AS SHORT AS PRACTICAL.

11. (CONT'D)

INSERT E1 ONTO STRAIGHT LONG-LEGGED LEAD OF L1. INSERT LONG-LEGGED LEAD THROUGH TERMINAL HOLE OF C3 WHICH ALSO HAS ONE LEG OF C2 ALREADY CRIMPED ONTO IT. DO NOT SOLDER YET.

THE OTHER END OF L1 HAS A HOOKED LEAD WITH A BENT FOOT. PLACE THE BENT FOOT EXACTLY ON THE CENTER OF THE TRACE WHICH GOES TO THE COLLECTOR (CENTER) LEAD OF Q1. THE FOOT MUST BE AS CLOSE TO THE LEAD AS POSSIBLE. APPLY SUFFICIENT SOLDER TO COMPLETELY ENCLOSE THE BENT FOOT.

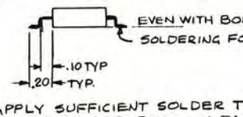
TACK SOLDER THE OTHER END OF L1. (DO NOT LOOP AROUND AS WIRE IS TOO RIGID) TACK SOLDER C2 TO TERMINAL. DO NOT COVER HOLE AS A WIRE FROM FEEDTHROUGH CAP MUST BE INSERTED BEFORE FINAL SOLDERING. (SEE NOTE 13).

REPEAT ABOVE FOR L3 COIL, USING E3 AND C8.

SIMILARLY, LOCATE THE BENT FOOT OF L2 ON THE CENTER OF THE TRACE AS CLOSE AS POSSIBLE TO THE COLLECTOR (CENTER) LEAD OF Q2. SOLDER.

INSERT E2 ONTO OTHER END OF L2 UNTIL IT SNUGS UP AGAINST COIL. USING A PAIR OF LONG-NOSE PLIERS, FORM A FOOT TO CAPTIVATE THE FERRITE BEAD E2. SOLDER THE FOOT TO THE GROUND PLANE AT A CONVENIENT POINT WHICH WILL NOT STRESS THE COIL. AGAIN, PROVIDE SUFFICIENT SOLDER TO COMPLETELY ENCLOSE THE BENT FOOT.

12. TRIM LEADS ON THE COMPONENTS, R1, R2, R3, R4, CR1, AND CR2 AS SHOWN HERE.



APPLY SUFFICIENT SOLDER TO ENTIRELY COVER SOLDER FOOT ON EACH END OF PART.

13. LAST, SOLDER RED WIRES, No. 22GA STRANDED 4700-0002, FROM FEED THROUGH CAPACITORS TO BOARD AS SHOWN ABOVE. KEEP WIRES AS SHORT AND DIRECT AS POSSIBLE, BUT NOT TAUT. (DWG SHOWS WIRE CURVED AROUND PARTS ONLY FOR CLARITY. WIRE ENDS AT C3 AND C9 ARE TO BE SOLDERED ONLY AFTER INSERTION THROUGH TERMINAL HOLES ON TAB. THE TACK SOLDERED COIL AND CAPACITOR LEADS ARE TO BE THOROUGHLY SOLDERED AT THIS POINT.

COMPLETION OF ASSEMBLY.

(SEE 6600-2135 FOR MANUAL ILLUST)

ITEM NO.	EN NO.	PART NO.	DESCRIPTION	REF DES

QTY PER ASSY — LIST OF MATERIALS

REMOVE ALL BURRS AND SHARP EDGES

TOLERANCES UNLESS OTHERWISE SPECIFIED
XX ± ANGULAR
XXX ± ±

DO NOT SCALE THIS PRINT

DRAWN BY	J.TAU	DATE 6/24/79
CHK. BY	LL	4/4/79
PROJ. ENG.		
MFG. ENG.		4/4/79
APPD.		
APPD.		
ECO NO.		

TFT TIME & FREQUENCY TECHNOLOGY INC.
3000 Olcott St., Santa Clara, California 95050
(408) 246-6365

TITLE: P.C. BD. ASSEMBLY POWER AMPLIFIER

SIZE D | DRAWING NO 6608-2060 | REV J

SCALE 2X | SHT 1 OF 1

Model S300

PWR. AMP A5 A5

Assembly #6608-2060
Rev. J

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
C1	CAP VAR .8-8.0 PF	1	1012-7293
C2	CAP ELECT 10 MFD 25V VERT MT	1	1010-0099
C3	CAP SILMIC 200 PF	1	1003-0201
C4	CAP CHIP 10 PF	1	1009-0100
C5	CAP CHIP 47 PF	1	1009-0470
C6	CAP CHIP 10 PF	1	1009-0100
C7	CAP VAR .8-8.0 PF	1	1012-7293
C8	CAP ELECT 10 MFD 25V VERT MT	1	1010-0099
C9	CAP SILMIC 200 PF	1	1003-0201
C10	CAP CHIP 10 PF	1	1009-0100
C11	CAP VAR .8-8.0 PF	1	1012-7293
C12	CAP CHIP 8.2 PF	1	1009-0082
C13	CAP CHIP 220 PF	1	1009-2200
C14	CAP CHIP 220 PF	1	1009-2200
CR1	DIO. HP 2810	1	1283-2810
CR2	DIO. HP 2810	1	1283-2810
E1	SHIELDING BEADS	1	1501-0654
E2	SHIELDING BEADS	1	1501-0654
E3	SHIELDING BEADS	1	1501-0654
E4	SHIELDING BEADS	1	1501-0654
J1	CONN, RF SUB MINI RT ANG	1	2210-5153
L1	CHOKE RF 4 TURN	1	1530-0006
L2	CHOKE RF 4 TURN	1	1530-0007
L3	CHOKE RF 4 TURN	1	1530-0006
L4	CHOKE RF 4 TURN	1	1530-0006
Q1	TRANS CTC DM5-12BA OR 8M085	1	1274-0512
Q2	TRANS CTC DM15-12BA OR 842	1	1274-1512
R1	RES CAR CM 1/8W 5% .047K	1	1064-0047
R2	RES CAR CM 1/8W 5% .047K	1	1064-0047
R3	RES CAR CM 1/8W 5% .047K	1	1064-0047
R4	RES CAR CM 1/8W 5% .047K	1	1064-0047
	P.C. BOARD	1	1600-2060
ASCH	SCHEMATIC		6601-2780
	COPPER FOIL 3/4 WIDE	A/R	5001-0003

6601-3375 | 1

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	PROD. RELEASE		5-13-83	
B	Q8, 2495150151 ADDED		7-1-83	
C	REVISED PER ECO 1622	KK	4-6-84	
D	REVISED PER ECO 1658	KK	11-8-84	
E	INFORMATION UPDATE	KK	5-9-85	
F	ADD AC AND DC VOLTAGE CALLOUT	KK	11-20-85	
G	R2 WAS 560 Ω, R2 WAS EN50B3, R8 WAS 1.2K	KK	12-3-85	

OUTPUT VCO FAIL SENSE FROM ALARM ON A2-A4

PHASE VOLTAGE FT11 0 R1 2.4K

-12V 5000PF LED FT10 FRONT PANEL LED

+12V 37mA FROM OUTPUT VCO A2-A4 C1 10 25V

A3J1-13 FRONT PANEL RF SWITCH R49 4.7K R50 10K Q8 2N3565 C28 10 25V R51 10K

+12S TO FT5 ON A2 (SWITCH P.A. AND DRIVER ON-OFF)

-12V 140mA TO VCO OUT PUT BD A2-A4 C2 10 25V

TO SYNTHESIZER BD A2-A3 +12V

Q1 2N5087 R2 1.2K R6 10K 7.4 R7 100K R8 4.7K

Q2 2N4275 R3 470 Q3 TIP-32 R4 10K

8 H1 PCLI-43 HEATER

C4 .1 R5 680 K

CR2 IN3064 CR1 IN3064 C3 .1

0 TO 2.9 R9 10K C6 5.6 PF R10 100K C7 .1 R13 3.33M C5 180pf

U1 LF353 SEE NOTE 10 R11 82K R12 4.7K C8 .1

-16mV -12mV

CR7 DKV6520 CR3 DB105G FOR 330/450 MHz OPERATION ONLY FOR 750 MHz OPERATION ONLY

L1 .15 C9 1-14pf 10T *R15 470 *R14 2.2K *R16 1K C10 10PF R17* 1K C27 100uf 25V

Q4 BRF95 C11 3PF L2 .12 L3 .33 L4 .18 C12 10PF *R18 27 *R19 39

*R20 18 *R21 22 1.5Ω TO VCO OUTPUT A2-A4 +12 dBm AT 876.5MHz 530mV RF

*R22 22 *R23 56 *R24 27 *R47 82

R28 *R29 4.7K 2K *R30 4.7K C13 10PF C14 10PF *R31 220 *R32 220 R26 56K R27 56K

CR4 HP2810 CR5 HP2810 CR6 4A5112 C15 6PF C16 6PF *R33 68 *R34 68

T1 3T T37-10 9T TOROID 2800mV RF .04 8Vp-p *R35 100

Q6 PN918 C23 .22 C20 10PF L5 .15 R42 2K F.S. C22 1-14pf 10T C19 33 pf

Q7 PN918 R45 6.2K C21 560 pf R46 4.7K R43 22 R44 390 L6 1.0 Y1 C24 .1

C18 100 pf R40 1.8K R36 2.7K R41 470

Q5 2N5109 *R37 3.9 R38 47 R39 56 C17 560 pf

-12V TO VCO/MOD A2-A2

TO SYNTHESIZER FAIL SENSE ALARM ON A2-A3

9 ON MODEL NO. 7710A, 7720A, B310 & B320 DELETE CR3

8 NOT INSTALLED ON B301 RECEIVER

7. ⬭ = AC VOLTAGE TYPICAL VOLTAGES PP

6. ▭ = DC VOLTAGE

5. ALL DC MEASUREMENTS MADE WITH NO RF INPUT.

4. REF; PCB ASSY 6608-3375
PC BD 1600-3375

3. INDUCTOR VALUES ARE IN MICROHENERIES

2. CAPACITOR VALUES ARE IN MICROFARADS

1. RESISTOR VALUES ARE IN OHMS 1/4W 5%

NOTES: UNLESS OTHERWISE SPECIFIED

10 DO NOT USE SOCKET FOR U1

* PARTS TO BE CARBON COMP ONLY

8300	6608-3375
8301	6608-3375
MODEL	NEXT ASSY
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ± —
DECIMAL = 2 PLACE ± —, 3 PLACE ± —
BREAK = .010MIN
SURFACE ROUGHNESS = — MICROINCHES RMS MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = — MAX
THREADS = CLASS 2
MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
MATERIAL			
FINISH			

TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584

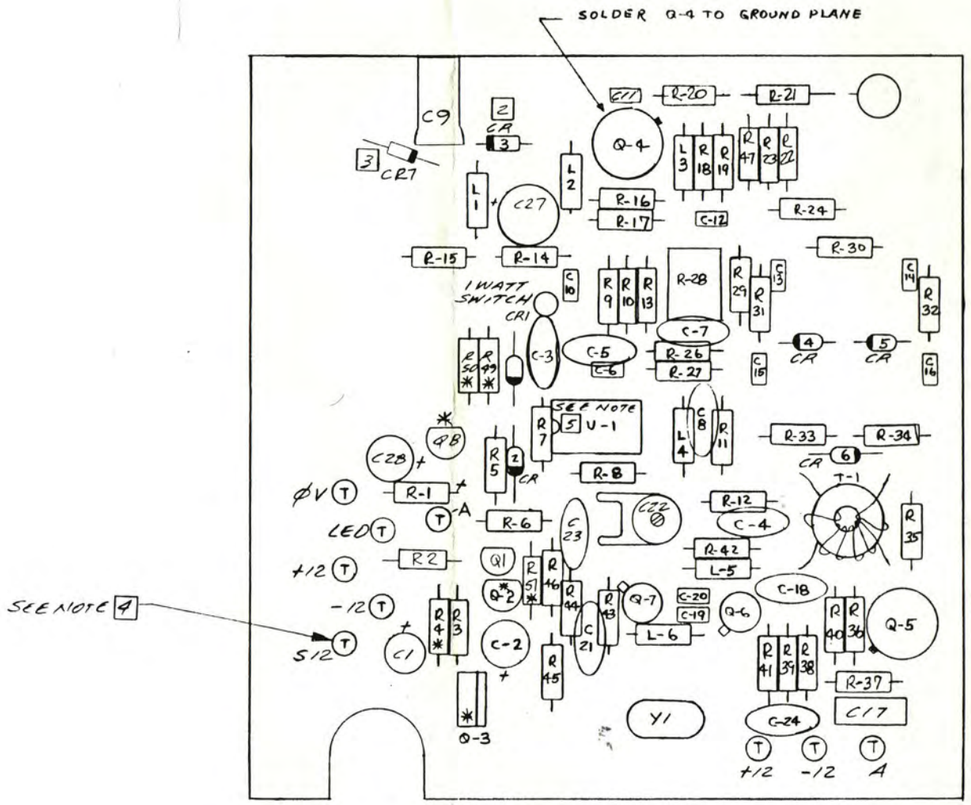
SCHEMATIC- LOCK UPCONVERTER L.O. A2-A1

DR. BY	L. Mushie	5-13-83
CK. BY		
ENGR.		9/20/84
MFG.		7/1/84
Q.A.		7/6/84

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	D	6601-3375	G

SCALE — DO NOT SCALE PRINT SHEET 1 OF 1

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	PROD. RELEASE	5-12-83	
	B	GND PADS ADDED	6-27-83	
	C	QB, R49, BSD ADDED	9-1-83	
	D	REVISED PER ECO 1622	4-6-84	
	E	REVISED PER ECO 1658	10-23-84	
	F	REVISED PER ECO 1664	10-25-84	
	G	R2 WAS 560, R42 WAS 1.2K, Q2 WAS 2N5089	12-23-85	



REF; SCHEMATIC 6601-3375
PCB 1600-3375
FOR MATL LIST SEE 6608-3375

5 DO NOT INSTALL SOCKET FOR U1

4 INDICATES AMP PIN

3 DELETE CR7 ON MODEL 8300, 8301

2 DELETE CR3 ON MODEL 7710A, 7720A, 8310, 8320

1. * NOT TO BE USED IN MODEL 8301

NOTE; UNLESS OTHERWISE SPECIFIED

QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION
			PARTS LIST	

5102-3385	8300
5102-3371	8301
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES °

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN AR2	1-12-83
CHECKED	1/20/83
ISSUED	1/20/83
	1/27/83
ENGINEERING	5/14/8

TIME & FREQUENCY TECHNOLOGY INC.

PCB ASSEMBLY-
LOCK UPCONVERTER L.O.

SIZE	FSCM NO.	DWG. NO.	REV.
C		6608-3375	G

SCALE 2/1 SHEET 1 OF 1

DWG. NO. 6608-3375 SH 1 REV.

Model 8300 — LOCK UPCONVERTER L.O. — Assembly #6608-3375 Rev. G

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
R1	RESISTOR CAR COMP. 1/4W 5% 2.4K	1	1065-2401
R2	RESISTOR CAR COMP. 1/4W 5% 560	1	1065-0560
R3	RESISTOR CAR COMP. 1/4W 5% 470	1	1065-0470
R4*	RESISTOR CAR COMP. 1/4W 5% 10K	5	1065-1002
R5	RESISTOR CAR COMP. 1/4W 5% 620K	1	1065-6203
R6	RESISTOR CAR COMP. 1/4W 5% 10K		1065-1002
R7	RESISTOR CAR COMP. 1/4W 5% 100K	2	1065-1003
R8	RESISTOR CAR COMP. 1/4W 5% 47K	1	1065-4702
R9	RESISTOR CAR COMP. 1/4W 5% 10K		1065-1002
R10	RESISTOR CAR COMP. 1/4W 5% 100K		1065-1003
R11	RESISTOR CAR COMP. 1/4W 5% 82K	1	1065-8202
R12	RESISTOR CAR COMP. 1/4W 5% 4.7K	4	1065-4701
R13	RESISTOR CAR COMP. 1/4W 5% 3.3MEG	1	1065-3304
R14	RESISTOR CAR COMP. 1/4W 5% 2.2K HI REL	1	1062-2201
R15	RESISTOR CAR COMP. 1/4W 5% 470 HI REL	1	1062-0470
R16	RESISTOR CAR COMP. 1/4W 5% 1K HI REL	2	1062-1001
R17	RESISTOR CAR COMP. 1/4W 5% 1K HI REL		1062-1001
R18	RESISTOR CAR COMP. 1/4W 5% 27 HI REL	2	1062-0027
R19	RESISTOR CAR COMP. 1/4W 5% 39 HI REL	1	1062-0039
R20	RESISTOR CAR COMP. 1/4W 5% 18 HI REL	1	1062-0018
R21	RESISTOR CAR COMP. 1/4W 5% 22 HI REL	2	1062-0022
R22	RESISTOR CAR COMP. 1/4W 5% 22 HI REL		1062-0022
R23	RESISTOR CAR COMP. 1/4W 5% 56 HI REL	1	1062-0056
R24	RESISTOR CAR COMP. 1/4W 5% 27 HI REL	1	1062-0027
R25	NOT USED		
R26	RESISTOR CAR COMP. 1/4W 5% 56K	2	1065-5602
R27	RESISTOR CAR COMP. 1/4W 5% 56K		1065-5602
R28	RESISTOR VARIABLE 20T 2K	1	1072-2000
R29	RESISTOR CAR COMP. 1/4W 5% 4.7K HI REL	2	1062-4701
R30	RESISTOR CAR COMP. 1/4W 5% 4.7K HI REL		1062-4701
R31	RESISTOR CAR COMP. 1/4W 5% 220 HI REL	2	1062-0220
R32	RESISTOR CAR COMP. 1/4W 5% 220 HI REL		1062-0220
R33	RESISTOR CAR COMP. 1/4W 5% 68 HI REL	2	1062-0068
R34	RESISTOR CAR COMP. 1/4W 5% 68 HI REL		1062-0068
R35	RESISTOR CAR COMP. 1/4W 5% 100 HI REL	1	1062-0100
R36	RESISTOR CAR COMP. 1/4W 5% 2.7K HI REL	1	1062-2701
R37	RESISTOR CAR COMP. 1/4W 5% 3.9 HI REL	1	1062-0003
R38	RESISTOR CAR COMP. 1/4W 5% 47	1	1065-0047
R39	RESISTOR CAR COMP. 1/4W 5% 56	1	1065-0056
R40	RESISTOR CAR COMP. 1/4W 5% 1.8K HI REL	1	1062-1801
R41	RESISTOR CAR COMP. 1/4W 5% 470 HI REL	1	1062-0470
R42	RESISTOR CAR COMP. 1/4W 5% 1.2K	1	1065-1201
R43	RESISTOR CAR COMP. 1/4W 5% 22	1	1065-0022
R44	RESISTOR CAR COMP. 1/4W 5% 390	1	1065-0390
R45	RESISTOR CAR COMP. 1/4W 5% 4.7K		1065-4701
R46	RESISTOR CAR COMP. 1/4W 5% 4.7K		1065-4701
R47	RESISTOR CAR COMP. 1/4W 5% 82 HI REL	1	1062-0082
R48	NOT USED		
R49*	RESISTOR CAR COMP. 1/4W 5% 4.7K		1065-4701
R50*	RESISTOR CAR COMP. 1/4W 5% 10K		1065-1002
R51*	RESISTOR CAR COMP 1/4W 5% 10K		1065-1002

Model 8300 — LOCK UPCONVERTER L.O. — Assembly #6608-3375 Rev. G

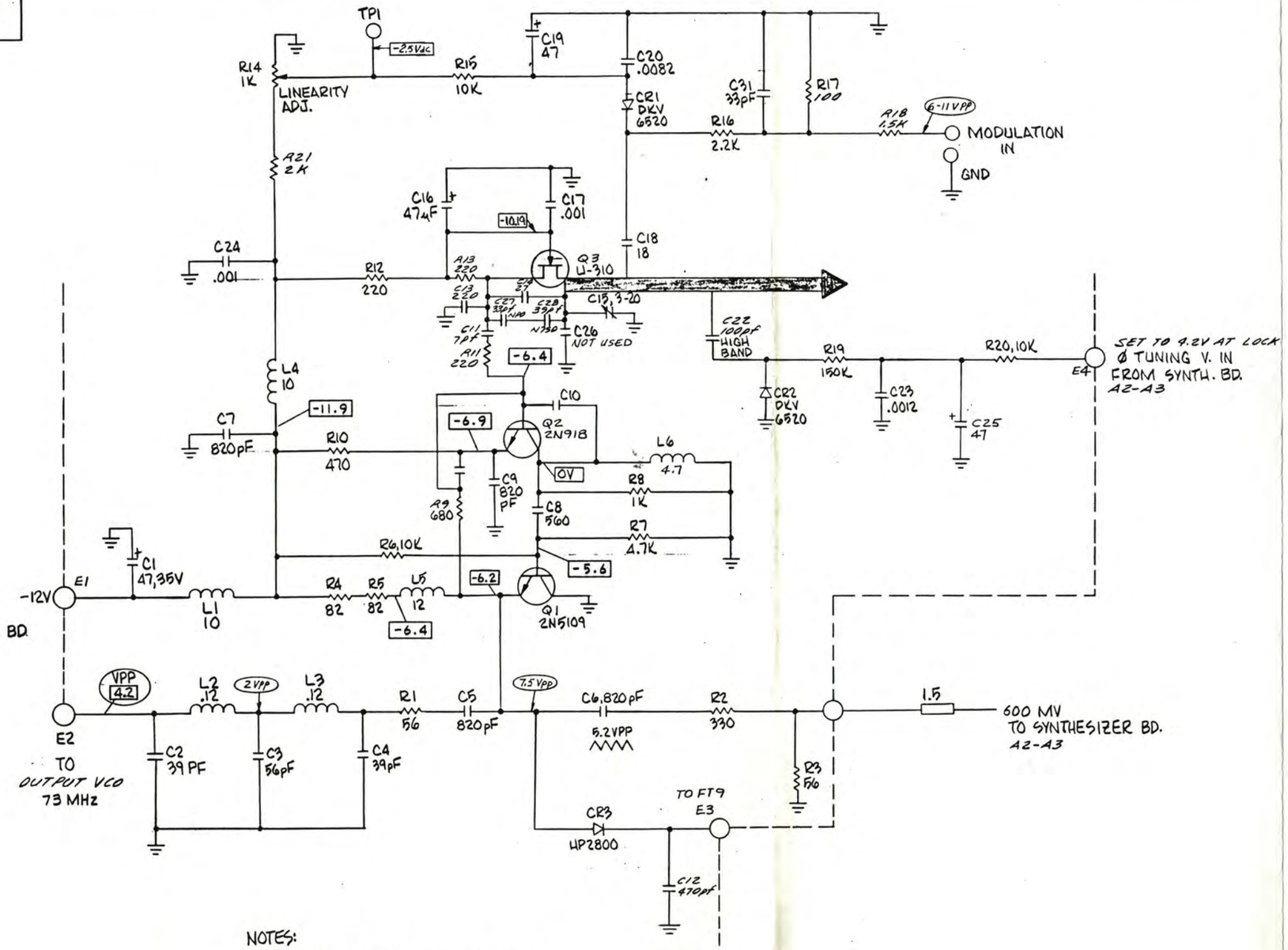
CKT REF	DESCRIPTION	QTY	TFT STOCK NO
C1	CAP ELECT 25V 10UFD	3	1010-0099
C2	CAP ELECT. 25V 10UFD		1010-0099
C3	CAP MONO .1UFD	5	1016-0010
C4	CAP MONO .1UFD		1016-0010
C5	CAP MICA 180PF	1	1001-0181
C6	CAP MINI CERAMIC NPO 100V 5.6PF	3	1005-0055
C7	CAP MONO .1UFD		1016-0010
C8	CAP MONO .1UFD		1016-0010
C9	CAP VARIABLE 1-14PF	1	1012-0020
C10	CAP MINI CERAMIC NPO 63V 10PF	5	1005-0011
C11	CAP MINI CERAMIC NPO 100V 3.3PF	1	1005-0032
C12	CAP MINI CERAMIC NPO 63V 10PF		1005-0011
C13	CAP MINI CERAMIC NPO 63V 10PF		1005-0011
C14	CAP MINI CERAMIC NPO 63V 10PF		1005-0011
C15	CAP MINI CERAMIC NPO 100V 5.6PF		1005-0055
C16	CAP MINI CERAMIC NPO 100V 5.6PF		1005-0055
C17	CAP CK05BX 560PF	2	1015-0560
C18	CAP CERAMIC 100PF	1	1015-0100
C19	CAP MINI CERAMIC NPO 63V 33PF	1	1005-0012
C20	CAP MINI CERAMIC NPO 63V 10PF		1005-0011
C21	CAP CK05BX 560PF		1015-0560
C22	CAP VARIABLE 1-14PF	1	1012-0814
C23	CAP CER .22MF CK06BX K	1	1015-0003
C24	CAP MONO .1UFD		1016-0010
C25	NOT USED		
C26	CAP CHIP 3PF 7700	1	1009-0030
C27	CAP ELECT 25V 100UFD	1	1010-0110
C28	CAP ELECT 25V 100UFD		1010-0099
L1	CHOKE RF .15UHY	2	1531-0015
L2	CHOKE PF .12UHY	1	1531-0012
L3	CHOKE RF .33UHY	1	1531-0033
L4	CHOKE RF .18UHY	1	1531-0018
L5	CHOKE RF .15UHY		1531-0015
L6	CHOKE RF 1UHY	1	1530-0010
CR1	DIODE 1N3064	2	1281-3064
CR2	DIODE 1N3064		1281-3064
CR3	VARICAP BB105G 2-16PF	1	1290-0105
CR4	DIODE MP2810	2	1283-2810
CR5	DIODE MP2810		1283-2810
CR6	DIODE AA5112	1	1282-0112
CR7	NOT USED		
CR8	NOT USED		
T1	TRANSFORMER	1	1501-0008

Model 8300 — LOCK UPCONVERTER L.O. — Assembly #6608-3375 Rev. G

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
Q1	TRANSISTOR 2N5087	1	1271-5087
Q2*	TRANSISTOR 2N5089	1	1271-5089
Q3*	TRANSISTOR 11P-32	1	1272-0525
Q4	TRANSISTOR BTR95	1	1271-0095
Q5	TRANSISTOR 2N5109	1	1271-5109
Q6	TRANSISTOR PN918	2	1271-0918
Q7	TRANSISTOR PN918		1271-0918
Q8*	TRANSISTOR 2N3565	1	1271-3565
U1	I.C. LF353	1	1100-0353
Y1	XTAL 87.65MHZ	1	2400-8765
	I.C. SOCKET 8 PIN	1	2250-1008
H1*	CRYSTAL HEATER PCL1-43	1	2450-0004
	PCB	1	1600-3375
	SOLID PIN PLUG	9	2140-0071

* R4, R49, R50, R51, Q2, Q3, Q8, AND H1 ARE NOT USED ON MODEL 8301.

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	PRODUCT RELEASE			
B	REVISED PER ECO 1625	MK	4-12-84	
C	REVISED PER ECO 1651	RL	8-31-84	
D	ADD A21 PER ECO 1672	RL	5-8-85	
E	ADD AC AND DC VOLTAGE CALLOUT	[illegible]	12-20-85	
F	REVISED PER ECO 1729	GAK	12-24-87	



NOTES:

1. RESISTOR VALUES ARE IN OHMS, 1/4 W, 5%
2. CAPACITOR VALUES ARE IN MICROFARADS.
3. ALL DC MEASUREMENTS MADE WITH NO RF INPUT.
4. ▭ = DC VOLTAGE
5. INDUCTOR VALUES ARE IN MICROHENRIES
6. LEVELS ARE BOARD TO BOARD TESTS
7. ⬭ = AC VOLTAGE

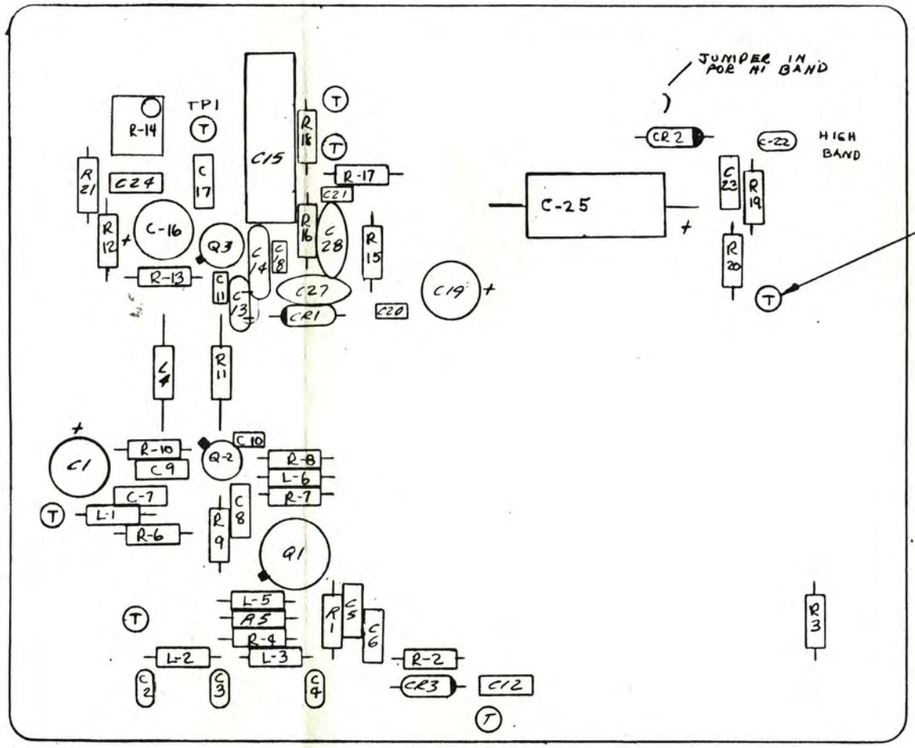
8300	6608-3377
MODEL	NEXT ASSY
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ±_____
DECIMAL =
2 PLACE ± _____
3 PLACE ± _____
BREAK = .010MIN
SURFACE ROUGHNESS = _____ MICROINCHES RMS MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = _____ MAX
THREADS = CLASS 2
MARK IN ACCORDANCE WITH TFT SPEC 8300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
MATERIAL			TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584
FINISH			SCHEMATIC, VCO/MODULATOR A2-A2
DR. BY		10/83	
CK. BY			
ENGR.		10/18/84	
MFG.		7/9/87	
Q.A.		7/16/87	
		7/7/87	

CODE IDENT NO. | SIZE D | DRAWING NO. 6601-3377 | REV. F
SCALE NTS | DO NOT SCALE PRINT | SHEET 1 OF 1

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	PROD. RELEASE	9-1-83	
	B	REVISED PER ECO 1625	4-16-84	
	C	REVISED PER ECO 1651	8-31-84	
	D	RISWAS 12K	6-5-85	
	E	CHANGE ARTWORK FOR ADDITION OF C27 & C28. C27 & C28 WAS HAND SOLDERED ONTO BOARD	1-9-86	



QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION
			PARTS LIST	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

LANCOM FOR TFT

PCB ASSEMBLY - VCO / MODULATOR

APPROVALS	DATE
DRAWN	3-24-83
CHECKED	4/24/84
ISSUED	4-15-83
MFR	7/9/84
QA	7/16/84
K. Kincaid	7/16/84

6608-3377	8300
NEXT ASSY	USED ON
APPLICATION	

SIZE C | FSCM NO. | DWG. NO. 6608-3377 | REV. E

SCALE — | SHEET 1 OF 1

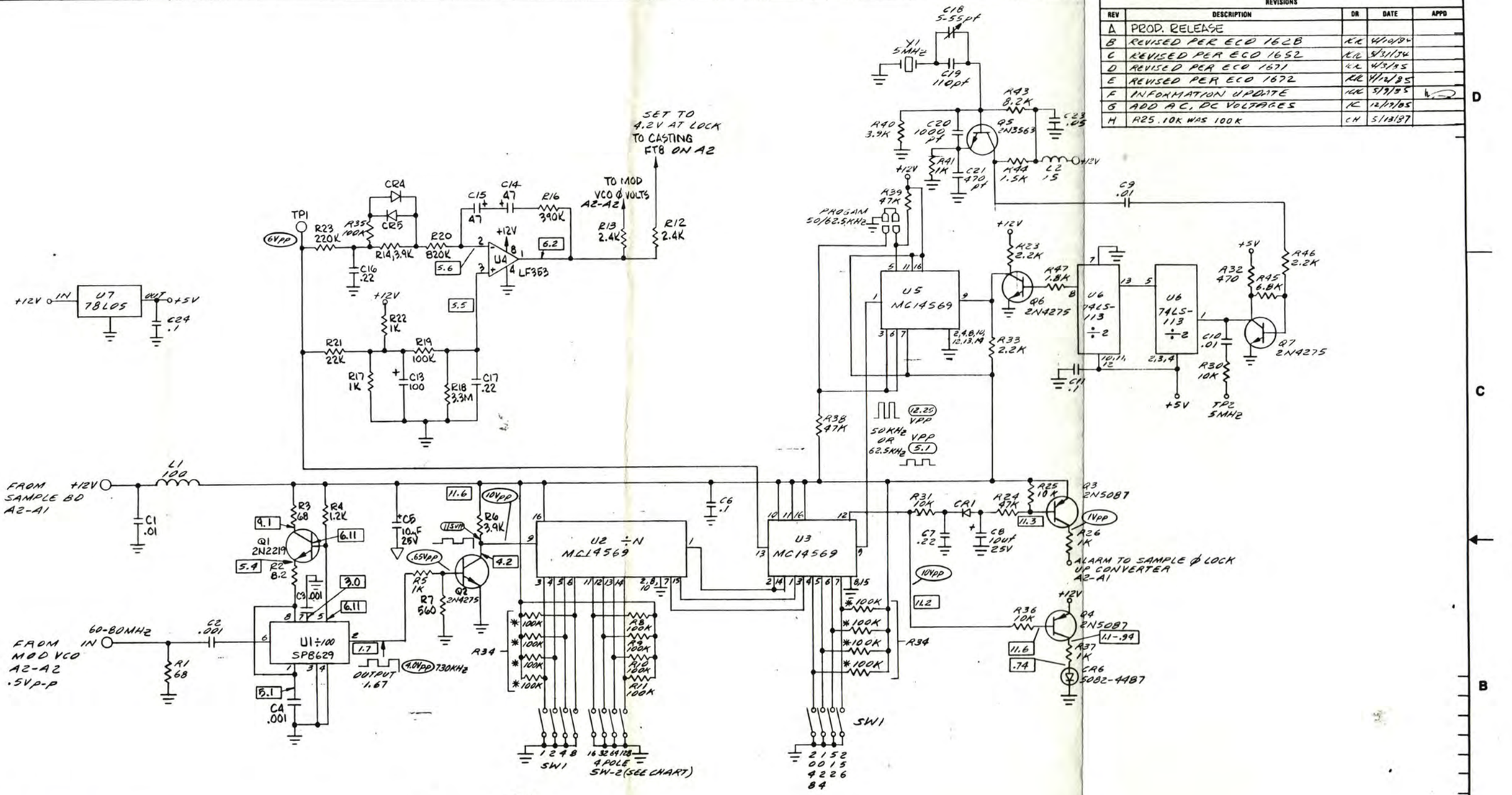
DWG. NO. | SH | REV.

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
C1	Cap Elect 35V 47uf	4	1010-0470
C2	Cap Mini Cer NPO Rect 39pf	2	1017-0390
C3	Cap Mica 57pf	1	1001-0560
C4	Cap Mini Cer NPO Rect 39pf		1017-0390
C5	Cap Cer CK05 .001uf	8	1015-0010
C6	Cap Cer CK05 .001uf		1015-0010
C7	Cap Cer CK05 .001uf		1015-0010
C8	Cap Cer CK05 560pf	1	1015-0560
C9	Cap Cer CK05 .001uf		1015-0010
C10	NOT USED		
C11	Cap Mini Cer 6.8pf	1	1017-0068
C12	Cap Cer CK05 .001uf		1015-0010
C13	Cap Mica CM04 220pf	1	1001-2200
C14	Cap Mica CM04 27pf	1	1001-0270
C15	Cap Trimmer #5601 3-20pf	1	1012-0320
C16	Cap Elect 35V 47uf		1010-0470
C17	Cap Cer CK05 .001uf		1015-0010
C18	Cap Mini Cer 10pf	1	1017-0100
C19	Cap Elect 35V 47uf		1010-0470
C20	Cap Cer .0082uf	1	1015-0082
C21	Cap Mini Cer 33pf	1	1017-0330
C22	Cap Cer 100pf	1	1015-0100
C23	Cap Cer CK05 .001uf		1015-0010
C24	Cap Cer CK05 .001uf		1015-0010
C25	Cap Elect 35V 47uf		1010-0470
C26	NOT USED		
C27	Cap Cer Disc NPO 33pf	1	1005-0034
C28	Cap Cer Disc N750 O 39pf	1	1005-0039
CR1	Diode Varicap DKV6520	2	1290-6520
CR2	Diode Varicap DKV6520		1290-6520
CR3	Diode HP2810	1	1283-2810
L1	Inductor 10uHy	2	1530-0100
L2	Inductor .12uHy	2	1531-0012
L3	Inductor .12uHy		1531-0012
L4	Inductor 10uHy		1530-0100
L5	Inductor 12uHy	1	1530-0120
L6	Inductor 4.7uHy	1	1531-0471
Q1	Transistor 2N5109	1	1271-5109
Q2	Transistor 2N918	1	1271-0918
Q3	Transistor U310	1	1271-0310

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
R1	Res Car Comp 1/4W 5% 56 Hi Rel	2	1062-0056
R2	Res Car Comp 1/4W 5% 330 Hi Rel	1	1062-0330
R3	Res Car Comp 1/4W 5% 56 Hi Rel		1062-0056
R4	Res Car Comp 1/4W 5% 82	2	1065-0082
R5	Res Car Comp 1/4W 5% 82		1065-0082
R6	Res Car Comp 1/4W 5% 10K	3	1065-1002
R7	Res Car Comp 1/4W 5% 4.7K	1	1065-4701
R8	Res Car Comp 1/4W 5% 1K	1	1065-1001
R9	Res Car Comp 1/4W 5% 680 Hi Rel	1	1062-0680
R10	Res Car Comp 1/4W 5% 470 Hi Rel	1	1062-0470
R11	Res Car Comp 1/4W 5% 220 Hi Rel	3	1062-0220
R12	Res Car Comp 1/4W 5% 220 Hi Rel		1062-0220
R13	Res Car Comp 1/4W 5% 220 Hi Rel		1062-0220
R14	Pot 10T Vert 1K	1	1072-1000
R15	Res Car Comp 1/4W 5% 10K		1065-1002
R16	Res Car Comp 1/4W 5% 2.2K Hi Rel	1	1062-2201
R17	Res Car Comp 1/4W 5% 100	1	1065-0100
R18	Res Car Comp 1/4W 5% 1.5K	1	1065-1501
R19	Res Car Comp 1/4W 5% 150K Hi Rel	1	1062-1503
R20	Res Car Comp 1/4w 5% 10K		1065-1002
R21	NOT USED		
	Solid Pin	7	2140-0071
	PC Bd.	1	1600-3377

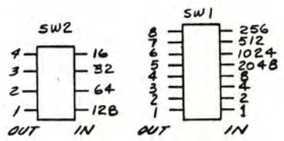
DWG. NO. 6601-3376 | SH 1 | REV H

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	PROD. RELEASE			
B	REVISED PER ECO 1626	KK	4/16/84	
C	REVISED PER ECO 1652	KK	8/31/84	
D	REVISED PER ECO 1671	KK	4/3/85	
E	REVISED PER ECO 1672	KK	11/12/85	
F	INFORMATION UPDATE	KK	5/9/95	
G	ADD A.C, DC VOLTAGES	KK	12/17/85	
H	R25 10K WAS 100K	CH	5/10/87	



NOTES:

1. ▭ = AC VOLTAGE, TYPICAL VOLTAGES FOR 1MVRF INPUT.
2. ▭ = DC VOLTAGE
3. ALL DC MEASUREMENTS MADE WITH NO RF INPUT.
4. CAPACITOR VALUES ARE IN MICROFARADS.
5. RESISTOR VALUES ARE IN OHMS, 1/4W, 5%.
6. * PANASONIC Q904 (R34)
7. ALL DIODES 1N3064
8. LEVELS ARE BOARD TO BOARD TEST



ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
MATERIAL			
FINISH			

TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584

SCHEMATIC, VCO/MOD SYNTHESIZER A2-A3

DR. BY.	D.H.		
CK. BY.			
ENGR.			
MFG.			
Q.A.			

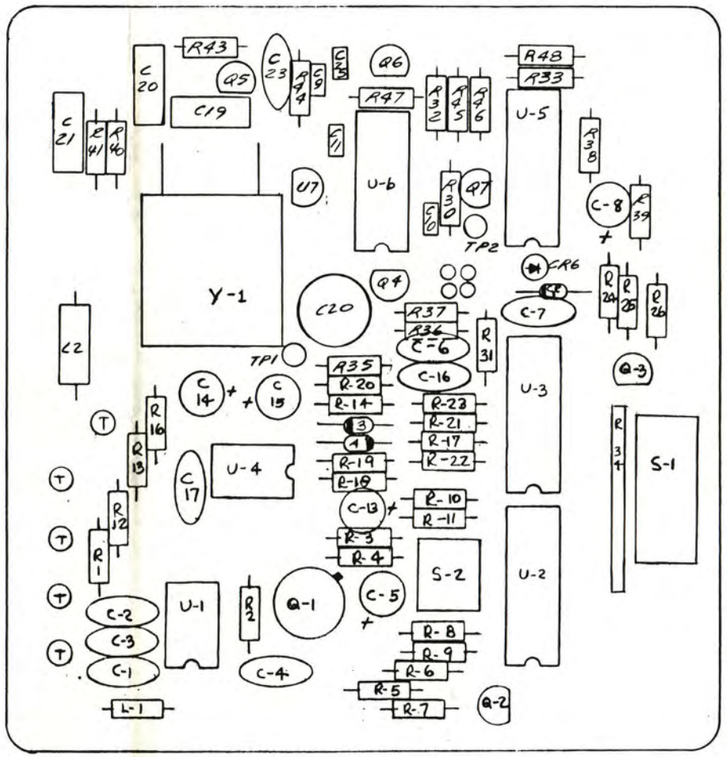
CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	D	6601-3376	H

SCALE N/A | DO NOT SCALE PRINT | SHEET 1 OF 1

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ±
DECIMAL = 2 PLACE ± 3 PLACE ±
BREAK = .010MIN
SURFACE ROUGHNESS = MICROINCHES RMS MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = MAX
THREADS = CLASS 2
MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

MODEL	NEXT ASSY
8300	6608-3376
APPLICATION	

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
ALL	1	NEW LAYOUT	2-24-83	UKZ
2,3C	2	ADDED DUAL BW	4-18-83	UKZ
	A	PROD. RELEASE	9-1-83	
	B	REVISED PER ECO 1628	4-9-84	
	C	REVISED PER ECO 1652	3-30-84	
	D	REVISED PER ECO 1671	4-3-85	
	E	REVISED PER ECO 1672	4-11-85	
	F	ADD R48 AND C25	5-15-87	



* 60 kHz

* 62.5 kHz

*NOTE: INSTALL AT TEST LEVEL ON COMPONENT SIDE

DWG. NO.

SH

REV.

	QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION

PARTS LIST

1	
6608-3376	8300
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN UKZ	1-10-83
CHECKED	1/5/83
ISSUED UKZ	4-18-83
MFG	7/9/84
QA	7/14/84
K Ramsey	7/14/84

LANCOM FOR TFT

PCB ASSEMBLY-
VCO/MOD SYNTHESIZER

SIZE	FSCM NO.	DWG. NO.	REV.
C		6608-3376	F

SCALE 2/1 SHEET 1 OF 1

Model 8300 — VCO/MOD SYNTHESIZER — Assembly #6608-3376 Rev. F

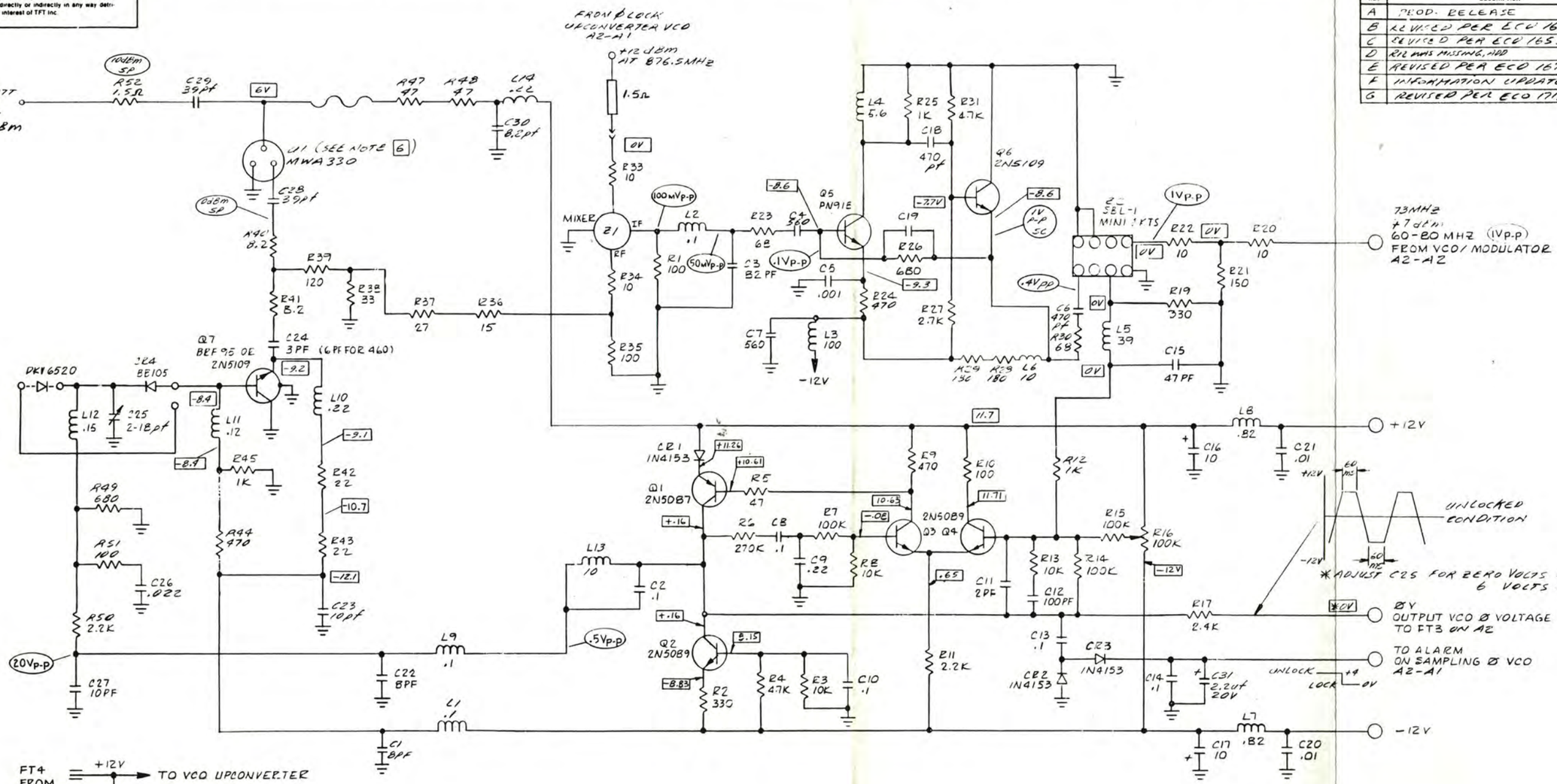
CKT REF	DESCRIPTION	QTY	TFT STOCK NO
C1	CAP CER CK05 .01UF	1	1015-0002
C2	CAP CER CK05 .001UF	3	1015-0010
C3	CAP CER CK05 .001UF		1015-0010
C4	CAP CER CK05 .001UF		1015-0010
C5	CAP ELECT 16V 10UF	2	1010-0011
C6	CAP CER CK05 .1UF	4	1015-0001
C7	CAP CER CK06 .22UF	3	1015-0003
C8	CAP ELECT 10UF		1010-0011
C9	CAP CER CK05 .1UF		1015-0001
C10	CAP CER CK05 .1UF		1015-0001
C11	CAP CER CK05 .1UF		1015-0001
C12	NOT USED		
C13	CAP ELECT 16V 100UF	1	1010-0110
C14	CAP ELECT 35V 47UF	2	1010-0470
C15	CAP ELECT 35V 47UF		1010-0470
C16	CAP CER CK05 .22UF		1015-0003
C17	CAP CER CK05 .22UF		1015-0003
C18	CAP VAR 5-55PF	1	1012-0555
C19	CAP MICA 110PF	1	1001-0111
C20	CAP MICA 1000PF	1	1001-0102
C21	CAP MICA 470PF	1	1001-0471
C22	CAP MICA 47PF	1	1001-0470
C23	CAP CER DISC .05UF	1	1005-5039
CR1	DIODE IN3064	5	1281-3064
CR2	DIODE IN3064		1281-3064
CR3	DIODE IN3064		1281-3064
CR4	DIODE IN3064		1281-3064
CR5	DIODE IN3064		1281-3064
CR6	LED HP 1285-4487 CLEAR	1	1285-4487
L1	CHOKE 100UHY	1	1531-0101
L2	CHOKE 15MH	1	1530-0150
R1	RES CAR COMP 1/4W 5% 68	2	1065-0068
R2	RES CAR COMP 1/4W 5% 8.2	1	1065-0001
R3	RES CAR COMP 1/4W 5% 68		1065-0068
R4	RES CAR COMP 1/4W 5% 1.2K	1	1065-1201
R5	RES CAR COMP 1/4W 5% 1K	4	1065-1001
R6	RES CAR COMP 1/4W 5% 3.9K	1	1065-3901
R7	RES CAR COMP 1/4W 5% 560	1	1065-0560
R8	RES CAR COMP 1/4W 5% 100K	9	1065-1003
R9	RES CAR COMP 1/4W 5% 100K		1065-1003
R10	RES CAR COMP 1/4W 5% 100K		1065-1003
R11	RES CAR COMP 1/4W 5% 100K		1065-1003
R12	RES CAR COMP 1/4W 5% 2.4K	2	1065-2401
R13	RES CAR COMP 1/4W 5% 2.4K		1065-2401
R14	RES CAR COMP 1/4W 5% 3.9MEG	1	1065-3904
R15	NOT USED		
R16	RES CAR COMP 1/4W 5% 390K	1	1065-3903
R17	RES CAR COMP 1/4W 5% 1K		1065-1001
R18	RES CAR COMP 1/4W 5% 3.3MEG	1	1065-3304

Model 8300 — VCO/MOD SYNTHESIZER — Assembly #6608-3376 Rev. F

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
R19	RES CAR COMP 1/4W 5% 100K	1	1065-1003
R20	RES CAR COMP 1/4W 5% 820K	1	1065-8203
R21	RES CAR COMP 1/4W 5% 22K	1	1065-2202
R22	RES CAR COMP 1/4W 5% 1K		1065-1001
R23	RES CAR COMP 1/4W 5% 220K	1	1065-2203
R24	RES CAR COMP 1/4W 5% 47K	3	1065-4702
R25	RES CAR COMP 1/4W 5% 100K		1065-1003
R26	RES CAR COMP 1/4W 5% 1K		1065-1001
R27	RES CAR COMP 1/4W 5% 100K		1065-1003
R28	RES CAR COMP 1/4W 5% 100K		1065-1003
R29	RES CAR COMP 1/4W 5% 1.5K	1	1065-1501
R30	RES CAR COMP 1/4W 5% 56	1	1065-0056
R31	RES CAR COMP 1/4W 5% 10K	2	1065-1002
R32	NOT USED		
R33	RES CAR COMP 1/4W 5% 1MEG	1	1065-1004
R34	RES CAR COMP 1/4W 5% 100K	1	1073-1004
R35	RES CAR COMP 1/4W 5% 100K		1065-1003
R36	RES CAR COMP 1/4W 5% 10K		1065-1002
R37	RES CAR COMP 1/4W 5% 1K		1065-1001
R38	RES CAR COMP 1/4W 5% 47K		1065-4702
R39	RES CAR COMP 1/4W 5% 47K		1065-4702
R40	RES CAR COMP 1/4W 5% 1.5K	2	1065-1501
R41	RES CAR COMP 1/4W 5% 180	1	1065-0180
R42	RES CAR COMP 1/4W 5% 470	1	1065-0470
R43	RES CAR COMP 1/4W 5% 8.2K	1	1065-8201
R44	RES CAR COMP 1/4W 5% 1.5K		1065-1501
S1	SWITCH 16 PIN DIP	1	1800-2068
S2	SWITCH 8 PIN DIP	1	1800-2066
Q1	TRANSISTOR 2N2219	1	1271-2219
Q2	TRANSISTOR 2N5089	1	1271-5089
Q3	TRANSISTOR 2N5087	2	1271-5087
Q4	TRANSISTOR 2N5087		1271-5087
Q5	TRANSISTOR 2N3563	1	1271-3563
U1	IC SP8629	1	1100-8629
U2	IC MC14569	2	1102-4569
U3	IC MC14568	1	1102-4568
U4	IC LF353	1	1100-0353
U5	IC MC14569		1102-4569
U6	IC MC14011	1	1102-4011
Y1	CRYSTAL AMBIENT 5.00MHZ	1	2400-0501
	IC SOCKET 8 PIN	3	2250-1008
	IC SOCKET 14 PIN	1	2250-1014
	IC SOCKET 16 PIN	4	2250-1016
	SOLID PIN	7	2140-0071
	PC BOARD	1	1600-3376

DWG. NO. 6601-3374 SH 1 REV.

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	PROD. RELEASE		3-10-75	
B	REVISED PER ECO 1629	KK	4-11-84	
C	REVISED PER ECO 1653	KK	9-20-84	
D	R12 WAS MISSING, ADD	KK	12-5-84	
E	REVISED PER ECO 1673	KK	4-12-85	
F	INFORMATION UPDATE	K	5-3-85	
G	REVISED PER ECO 1713	KK	3-31-87	



FT4 FROM CASTING +12V
- TO VCO UPCONVERTER
- TO SAMPLE VCO BD
- TO 1 WATT AMP

FT2 FROM CASTING −12V
- TO UPCONVERTER
- TO VCO SAMPLE BD

9. ✱ PHASE LOCKED CONDITION
8. (SC): AF LEVEL MEASURE WITH OSCILLOSCOPE
7. (SP): RF LEVEL MEASURE WITH SPECTRUM ANALYZER
6. U1 MUST BE PUSHED DOWN ON BOARD WHEN SOLDERING
5. PCB 1600-3374
   SCHEMATIC 6601-3374
   MATL LIST 6608-3374
4. ▭ = DC VOLTAGE
3. INDUCTOR VALUES ARE IN MICROHENRIES
2. CAPACITOR VALUES ARE IN MICROFARADS
1. RESISTOR VALUES ARE IN OHMS, 1/4W. 5%.

NOTES: UNLESS OTHERWISE SPECIFIED

MODEL	NEXT ASSY
B300	6608-3374

APPLICATION

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ± —
DECIMAL = —
2 PLACE ± —
3 PLACE ± —
BREAK = .010 MIN
SURFACE ROUGHNESS = — MICROINCHES RMS MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = — MAX
THREADS = CLASS 2 MADE IN ACCORDANCE WITH TFT SPEC 5300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
MATERIAL			
FINISH			
DR. BY			
CK. BY.			
ENGR.			
MFG.			
Q.A.			

TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584

SCHEMATIC- OUTPUT VCO A2-A4

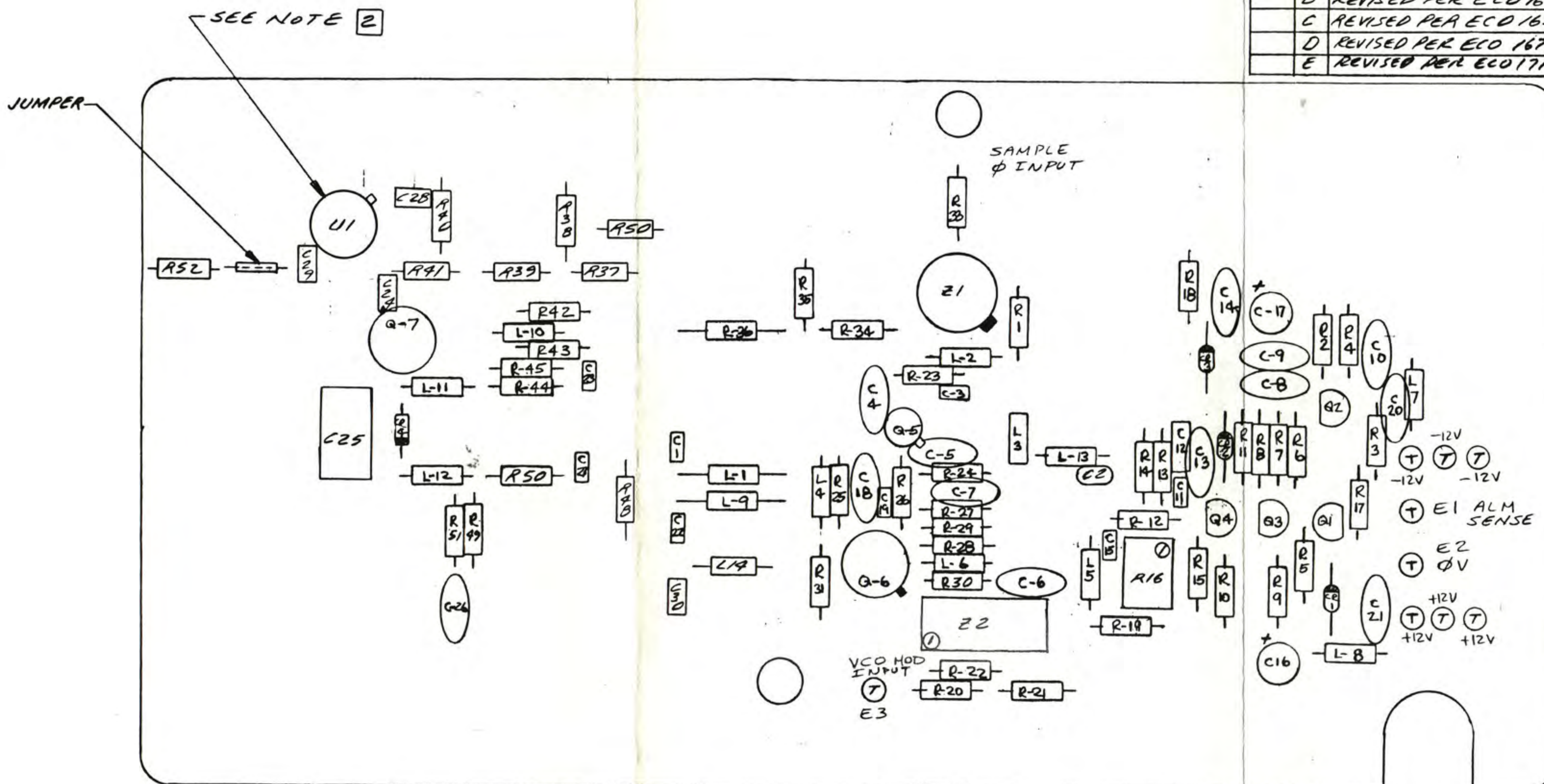
CODE IDENT NO.	SIZE	DRAWING NO.	REV
	D	6601-3374	G

SCALE — DO NOT SCALE PRINT SHEET 1 OF 1

4 3 2 1

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	PROD. RELEASE	9-1-83	
	B	REVISED PER ECO 1629	4-11-84	
	C	REVISED PER ECO 1653	8-30-84	
	D	REVISED PER ECO 1673	4-2-85	
	E	REVISED PER ECO 1713	3-31-87	EA

REVISIONS



PCB 1600-3374
SCHEMATIC 6601-3374

NOTE:
1. (T) INDICATES "AMP" PIN
[2] U1 MUST BE PUSHED DOWN ON BOARD WHEN SOLDERING

QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION

PARTS LIST

NEXT ASSY	USED ON
5102-3385	8300

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS		DATE
DRAWN	WR2	1-10-83
CHECKED		9/13/3
MFG	EA	9/14/3
QA		9/19/3
	K. Kimura	9/20/3

LANCOM FOR TFT

PCB ASSEMBLY-
OUTPUT VCO A2-A4

SIZE C | FSCM NO. | DWG. NO. 6608-3374 | REV. E

SCALE 2/1 | SHEET 1 OF 1

DWG. NO. SH REV.

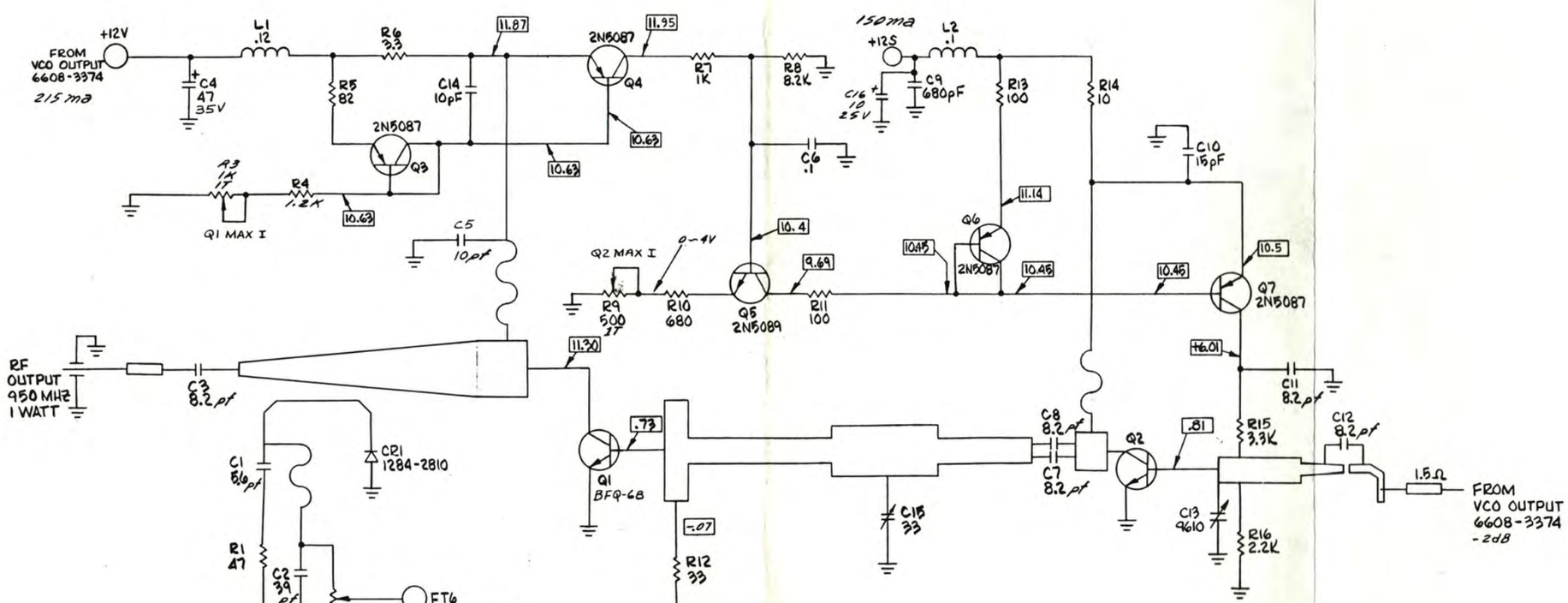
4 3 2 1

CKT REF	DESCRIPTION			QTY	TFT STOCK NO
C1	Cap Mini Cer		8.2pf	3	1017-0082
C2	Cap Mini Cer		.1pf	1	1016-0010
C3	Cap Mini Cer		82pf	1	1017-0820
C4	Cap Mica		560pf	2	1001-0561
C5	Cap Cer	CK05	.001uf	1	1015-0010
C6	Cap Mica		470pf	1	1001-0471
C7	Cap Mica		560pf		1001-0561
C8	Cap Cer	CK06	.1uf	4	1015-0015
C9	Cap Cer	CK06	.22uf	1	1015-0003
C10	Cap Cer	CK06	.1uf		1015-0015
C11	Cap Mini Cer		2.2pf	1	1017-0022
C12	Cap Mini Cer		100pf	1	1016-0101
C13	Cap Cer	CK06	.1uf		1015-0015
C14	Cap Cer	CK06	.1uf		1015-0015
C15	Cap Mini Cer		47pf	1	1017-0470
C16	Cap Elect	25V	10uf	2	1010-0099
C17	Cap Elect	25V	10uf		1010-0099
C18	Cap Cer	CK05	470pf	1	1015-0470
C19	NOT USED				
C20	Cap Cer	CK05	.01uf	2	1015-0002
C21	Cap Cer	CK05	.01uf		1015-0002
C22	Cap Mini Cer		8.2pf		1017-0082
C23	Cap Mini Cer		10pf	2	1017-0100
C24	Cap Mini Cer		3.3pf	1	1017-0033
C25	Cap Trimmer		2-20pf	1	1012-0020
C26	Cap Cer	CK05	.022uf	1	1015-0005
C27	Cap Mini Cer		10pf		1017-0100
C28	Cap Mini Cer	NPO RECT	39pf	2	1017-0390
C29	Cap Mini Cer	NPO RECT	39pf		1017-0390
C30	Cap Mini Cer		8.2pf		1017-0082
C31	Cap Tan 20V		2.2MFD	1	1008-0022
CR1	Diode	IN3064		3	1281-3064
CR2	Diode	IN3064			1281-3064
CR3	Diode	IN3064			1281-3064
CR4	Diode	BB105		1	1290-0105
CR5	NOT USED				
CR6	NOT USED				
Q1	Trans	2N5087		1	1271-5087
Q2	Trans	2N5089		3	1271-5089
Q3	Trans	2N5089			1271-5089
Q4	Trans	2N5089			1271-5089
Q5	Trans	2N918		1	1271-0918
Q6	Trans	2N5109		1	1271-5109
Q7	Trans	BFR-95		1	1271-0095

CKT REF	DESCRIPTION			QTY	TFT STOCK NO
R1	Res Car Comp	1/4W	5% 100 Hi Rel	3	1062-0100
R2	Res Car Comp	1/4W	5% 330	1	1065-0330
R3	Res Car Comp	1/4W	5% 10K	3	1065-1002
R4	Res Car Comp	1/4W	5% 4.7K	1	1065-4701
R5	Res Car Comp	1/4W	5% 47	1	1065-0047
R6	Res Car Comp	1/4W	5% 270K	1	1065-2703
R7	Res Car Comp	1/4W	5% 100K	3	1065-1003
R8	Res Car Comp	1/4W	5% 10K		1065-1002
R9	Res Car Comp	1/4W	5% 470	1	1065-0470
R10	Res Car Comp	1/4W	5% 100	1	1065-0100
R11	Res Car Comp	1/4W	5% 2.2K	1	1065-2201
R12	Res Car Comp	1/4W	5% 1K	1	1065-1001
R13	Res Car Comp	1/4W	5% 10K		1065-1002
R14	Res Car Comp	1/4W	5% 100K		1065-1003
R15	Res Car Comp	1/4W	5% 100K		1065-1003
R16	Pot Var	20T	100K	1	1071-1003
R17	Res Car Comp	1/4W	5% 2.4K	1	1065-2401
R18	Not Used				
R19	Res Car Comp	1/4W	5% 330 Hi Rel	1	1062-0330
R20	Res Car Comp	1/4W	5% 10 Hi Rel	4	1062-0010
R21	Res Car Comp	1/4W	5% 150 Hi Rel	2	1062-0150
R22	Res Car Comp	1/4W	5% 10 Hi Rel		1062-0010
R23	Res Car Comp	1/4W	5% 68 Hi Rel	2	1062-0068
R24	Res Car Comp	1/4W	5% 470 Hi Rel	2	1062-0470
R25	Res Car Comp	1/4W	5% 1K Hi Rel	2	1062-1001
R26	Res Car Comp	1/4W	5% 680 Hi Rel	2	1062-0680
R27	Res Car Comp	1/4W	5% 2.7K Hi Rel	1	1062-2701
R28	Res Car Comp	1/4W	5% 180 Hi Rel	2	1062-0180
R29	Res Car Comp	1/4W	5% 180 Hi Rel		1062-0180
R30	Res Car Comp	1/4W	5% 68 Hi Rel		1062-0068
R31	Res Car Comp	1/4W	5% 4.7K Hi Rel	1	1062-4701
R32	Not Used				
R33	Res Car Comp	1/4W	5% 10 Hi Rel		1062-0010
R34	Res Car Comp	1/4W	5% 10 Hi Rel		1062-0010
R35	Res Car Comp	1/4W	5% 100 Hi Rel		1062-0100
R36	Res Car Comp	1/4W	5% 15 Hi Rel	1	1062-0015
R37	Res Car Comp	1/4W	5% 27 Hi Rel	1	1062-0027
R38	Res Car Comp	1/4W	5% 33 Hi Rel	1	1062-0033
R39	Res Car Comp	1/4W	5% 120 Hi Rel	1	1062-0120
R40	Res Car Comp	1/4W	5% 22 Hi Rel	1	1062-0022
R41	Res Car Comp	1/4W	5% 8.2 Hi Rel		1062-0001
R42	Res Car Comp	1/4W	5% 56 Hi Rel	2	1062-0056
R43	Res Car Comp	1/4W	5% 56 Hi Rel		1062-0056
R44	Res Car Comp	1/4W	5% 470 Hi Rel	1	1062-0470
R45	Res Car Comp	1/4W	5% 1K Hi Rel		1062-1001
R46	Res Car Comp	1/4W	5% 150 Hi Rel	2	1062-0150
R47	Res Car Comp	1/4W	5% 47 Hi Rel		1062-0047
R48	Res Car Comp	1/4W	5% 47 Hi Rel		1062-0047

CKT REF	DESCRIPTION			QTY	TFT STOCK NO
R49	Res Car Comp	1/4W	5% 680 Hi Rel		1062-0680
R50	Res Car Comp	1/4W	5% 2.2K Hi Rel	1	1062-2201
R51	Res Car Comp	1/4W	5% 100 Hi Rel		1062-0100
R52	Res Car Comp	1/2W	5% 1.5	1	1067-0015
L1	Choke		.1uHy	3	1531-0010
L2	Choke		.1uhy		1531-0010
L3	Choke		100uHy	1	1530-0101
L4	Choke		5.6uHy	1	1530-0056
L5	Choke		39uHy	1	1530-0390
L6	Choke		10uHy	2	1530-0100
L7	Choke		.82uHy	2	1531-0820
L8	Choke		.82uHy		1531-0820
L9	Choke		.1uHy		1531-0010
L10	Choke		.22uHy	2	1531-0020
L11	Choke		.12uHy	1	1531-0012
L12	Choke		.15uHy	1	1531-0015
L13	Choke		10uHy		1530-0100
L14	Choke		22uHy		1531-0020
Z1	Mixer Magnum		M53T	1	4500-0006
Z2	Mixer		SBL-1	1	4500-0005
	Pins			10	2140-0071
	PC Bd			1	1600-3374
U1	I/C GPD-430 THIN FILM AMP			1	1100-0430

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	PROD. RELEASE			
B	REVISED PER ECO 1639	KK	11-12-84	
C	ADD "3.0 TO 4.5VDC, 150MA, 215MA"	RK	2/8/85	
D	ADD DC VOLTAGES	L	12/9/85	



NOTES.

1. RESISTOR VALUES ARE IN OHMS, 1/4W, 5%.
2. CAPACITOR VALUES ARE IN MICROFARADS.
3. ALL DC MEASUREMENTS MADE WITH NO RF INPUT.
4. ☐ = DC VOLTAGE
5. INDUCTOR VALUES ARE IN MICROHENRIES

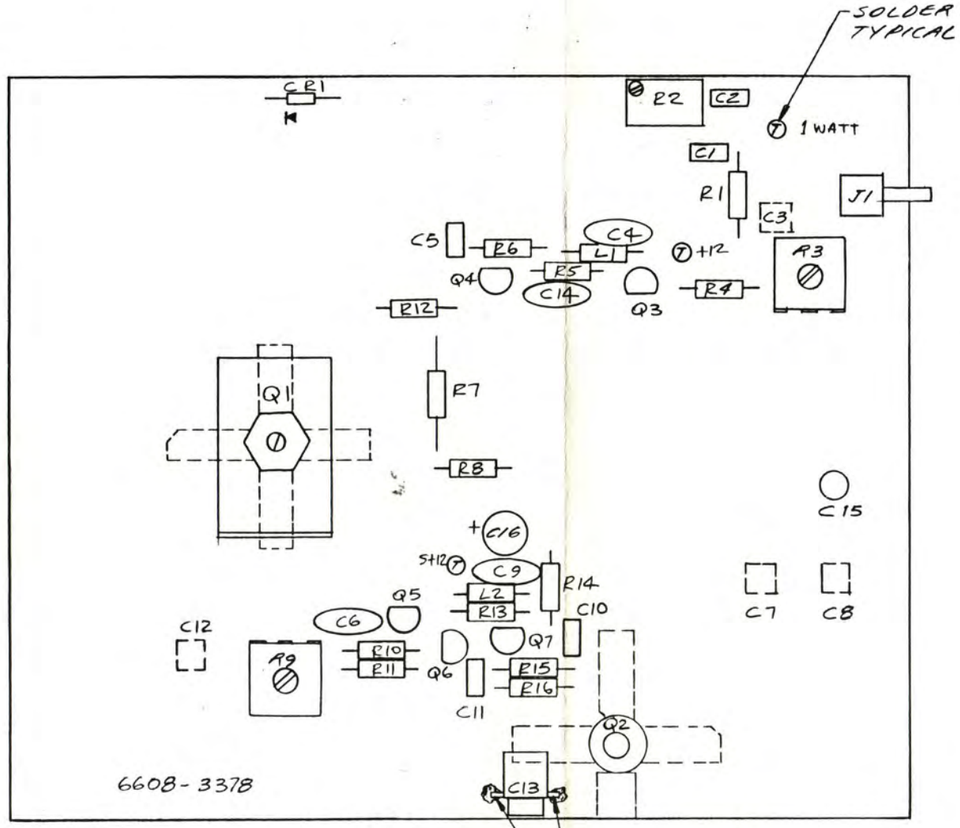
8300	6608-3378
MODEL	NEXT ASSY
APPLICATION	

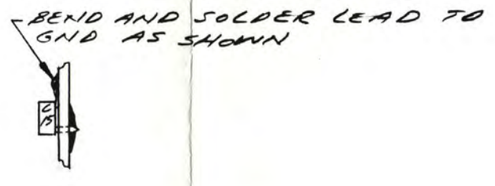
SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ± —
DECIMAL = 2 PLACE ± — 3 PLACE ± —
BREAK = .010MIN
SURFACE ROUGHNESS = — MICROINCHES RMS MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR. —
FILLET RADIUS = — MAX
THREADS = CLASS 2
MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
MATERIAL			TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584
FINISH			SCHEMATIC - 1 WATT AMP
DR. BY. D.H.			
CK. BY.			
ENGR.			12/9/85
MFG.			7/9/84
Q.A.			7/6/84

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	D	6601-3378	D
SCALE —	DO NOT SCALE PRINT	SHEET 1 OF 1	

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	PROD. RELEASE	[illegible]	9-1-83	
B	REVISED PER ECO 1634	KC	K-12-84	
C	PARTS LIST UPDATED	[illegible]	12-23-85	





2. FOR SCHEMATIC SEE 6601-3378
1. FOR MATL LIST SEE 6608-3378

NOTES

8300	5102-3385
MODEL	NEXT ASSY
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ± —
DECIMAL = —
2 PLACE ± —
3 PLACE ± —
BREAK = .010MIN
SURFACE ROUGHNESS = — MICROINCHES RMS: MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = — MAX
THREADS = CLASS 2 MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION

MATERIAL

FINISH

DR. BY	[illegible]	8-31-83
CK. BY		
ENGR.	[illegible]	10/18/83
MFG.	[illegible]	11/4/83
Q.A.	[illegible]	11/16/83
	K. Krause	11/16/83

TFT INC
3090 OAKMEAD VILLAGE DR.
SANTA CLARA, CA. 95051
(408) 727-7272 TWX 910-338-0584

PCB ASSEMBLY-
1 WATT DRIVER

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	C	6608-3378	C

SCALE FULL | DO NOT SCALE PRINT | SHEET 1 OF 1

Model 8300

1 WATT DRIVER

Assembly #6608-3378
Rev. C

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
C1	CAP MINI CER 5.6 PF	1	1005-0055
C2	CAP MINI CER 39 PF	1	1017-0390
C3	CAP MINI CER 8.2 PF	5	1017-0082
C4	CAP ELECT 35V 47 MF	1	1010-0470
C5	CAP MINI CER 10 PF	2	1017-0100
C6	CAP CK06 .1 MF	1	1015-0015
C7	CAP MINI CER 8.2 PF		1017-0082
C8	CAP MINI CER 8.2 PF		1017-0082
C9	CAP CK05BX 680 PF	1	1015-0681
C10	CAP MINI CER 15 PF	1	1017-0150
C11	CAP MINI CER 8.2 PF		1017-0082
C12	CAP MINI CER 8.2 PF		1017-0082
C13	CAP TRIMMER .8-10 PF	1	1012-0110
C14	CAP MINI CER 10 PF		1017-0100
C15	CAP VAR #9610 1-10 PF	1	1012-0111
C16	CAP VERT MT 10 UF 25 V	1	1010-0099
CR1	DIODDE 2810	1	1283-2810
J1	CONN, RF SUB MINI RT ANGLE	1	2210-5153
L1	INDUCTOR .12 MH	1	1531-0012
L2	INDUCTOR .1 MH	1	1531-0010
Q1	TRANSISTOR BFQ-68	1	1274-0068
Q2	TRANSISTOR BFQ-34	1	1274-0034
Q3	TRANSISTOR 2N5087	4	1271-5087
Q4	TRANSISTOR 2N5087		1271-5087
Q5	TRANSISTOR 2N5089	1	1271-5089
Q6	TRANSISTOR 2N5087		1271-5087
Q7	TRANSISTOR 2N5087		1271-5087
R1	RES CAR COMP 1/4W 5% 47	1	1062-0047
R2	RES POT PC MT 10T 100K	1	1072-1003
R3	RES POT PC MT 1T 1K	1	1072-1001
R4	RES CAR COMP 1/4W 5% 1.2K	1	1065-1201
R5	RES CAR COMP 1/4W 5% 82	1	1065-0082
R6	RES CAR COMP 1/4W 5% 3.3	1	1065-0002
R7	RES CAR COMP 1/4W 5% 1K	1	1065-1001
R8	RES CAR COMP 1/4W 5% 8.2K	1	1065-8201
R9	RES POT PC MT 1T 500	1	1072-0500
R10	RES CAR COMP 1/4W 5% 680	1	1065-0680
R11	RES CAR COMP 1/4W 5% 100	2	1065-0100
R12	RES CAR COMP 1/4W 5% 33 HI REL	1	1062-0033
R13	RES CAR COMP 1/4W 5% 100		1065-0100

Model 8300

1 WATT AMP

Assembly #6608-3378
Rev. C

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
R14	RES CAR COMP 1/4W 5% 10	1	1065-0010
R15	RES CAR COMP 1/4W 5% 3.3K HI REL	1	1062-3301
R16	RES CAR COMP 1/4W 5% 2.2K HI REL	1	1062-2201
	PCB	1	1600-3378
	SOLID PIN	3	2140-0071

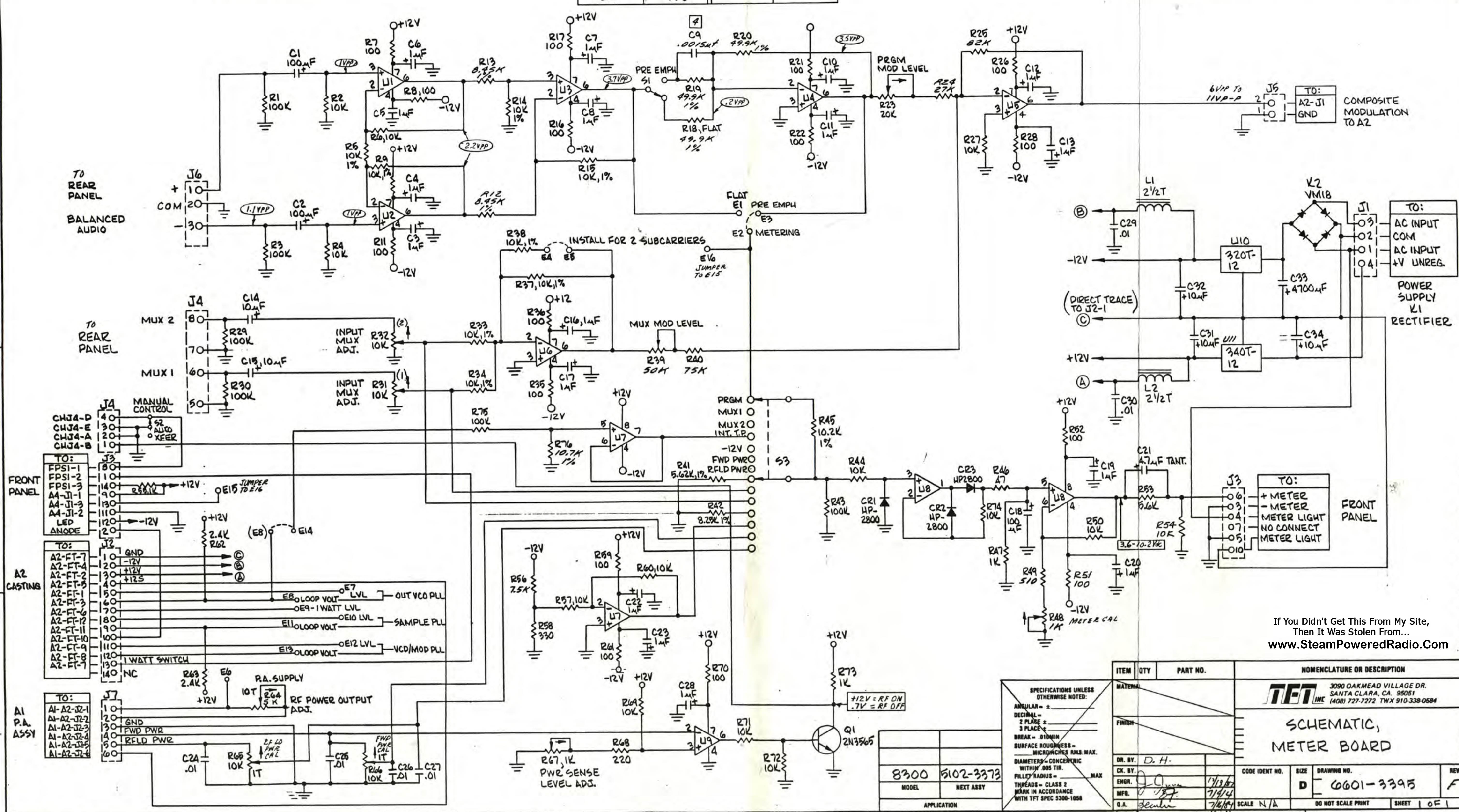
NOTES: UNLESS OTHERWISE SPECIFIED
1. RESISTOR VALUES ARE IN OHMS 1/4W 5%.
2. CAPACITOR VALUES ARE IN MICROFARADS
3. INDUCTOR VALUES ARE IN MICROHENRIES
4. .0015uf 2% FOR 75uS PRE-EMPHASIS
.001uf 2% FOR 50uS PRE-EMPHASIS
5. ▭ = DC VOLTAGE
6. ⬭ = AC VOLTAGE

REF DES.	DEVICE	REF DES.	DEVICE
U1	5534	U7	1458
U2	5534	U8	LF353
U3	5534	U9	3140
U4	356	U10	320T-12
U5	356	U11	340T-12
U6	356		

DWG. NO. 6601-3395 SH 1

REVISIONS

REV	DESCRIPTION	DR	DATE	APPD
A	PROD. RELEASE			
B	REVISED PER ECO 1627	KK	4/16/84	
C	REF J2; REVERSED +12V AND -12V	KK	10/24/84	
D	R64 WAS 200K REVISED PER ECO 1678	K	5/15/85	
E	ADD NOTE 4, R18 WAS ... REVISED PER ECO 1679	K	5/21/85	
F	REVISED PER ECO 1728	ERK	12-29-87	



MODEL	NEXT ASSY
8300	5102-3373

APPLICATION

SPECIFICATIONS UNLESS OTHERWISE NOTED: ANGULAR = ± ; DECIMAL = 2 PLACE ± 3 PLACE ± ; BREAK = .010 MIN; SURFACE ROUGHNESS = MICROINCHES RMS MAX.; DIAMETERS = CONCENTRIC WITHIN .005 TIR.; FILLET RADIUS = MAX; THREADS = CLASS 2; MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

TFT INC. 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584

SCHEMATIC, METER BOARD

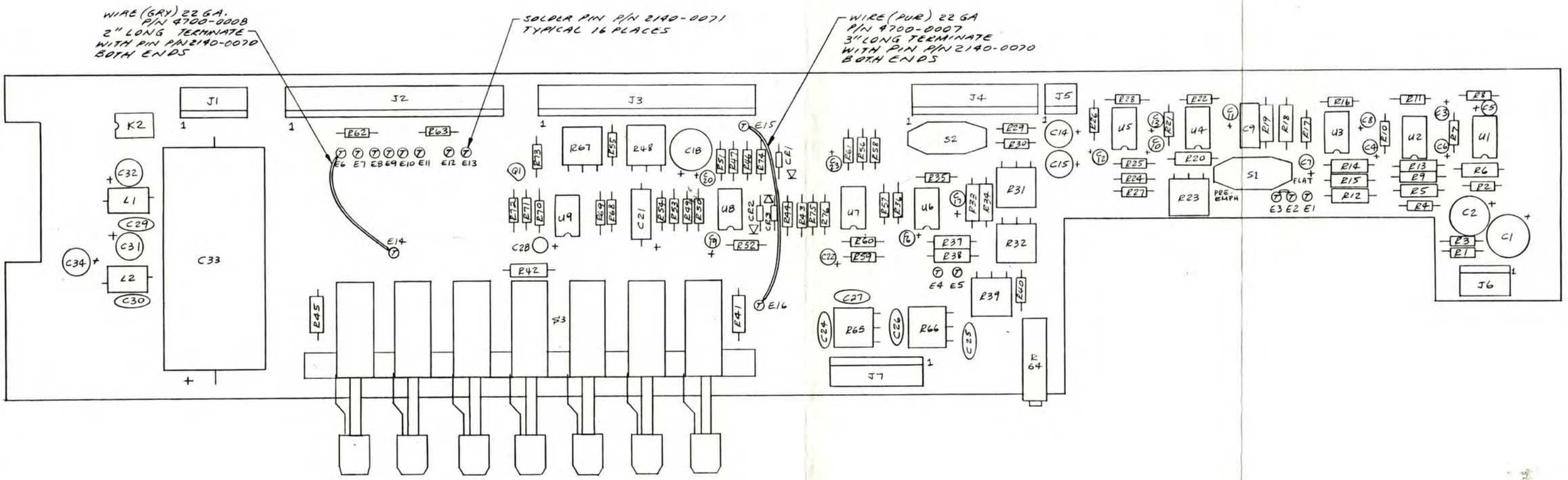
DR. BY D. H.

CODE IDENT NO. | SIZE D | DRAWING NO. 6601-3395 | REV. F

SCALE N/A | DO NOT SCALE PRINT | SHEET 1 OF 1

6608-3395 REV 1

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	PROD. RELEASE	CJA	9-1-83	
B	REVISED PER ECO 1627	KC	4-16-84	
C	A&U MAS 200E P/N 1869-2003 REVISED PER ECO 1675	K	5-15-85	
D	REVISED PER ECO 1679	K	5-20-85	



3. FOR PCB SEE 1600-3375
2. FOR SCHEMATIC SEE 6601-3395
1. FOR MATL LIST SEE 6608-3395

NOTES:

8300	5102-3373
MODEL	NEXT ASSY
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ±
DECIMAL = 2 PLACE ± 3 PLACE ±
BREAK = .010MIN
SURFACE ROUGHNESS = MICROINCHES RMS MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = MAX.
THREADS = CLASS 2 MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
MATERIAL			
FINISH			

DR. BY	L. Mueller	9-1-83
CK. BY		
ENGR.		9/30/83
MFG.		11/4/84
Q.A.		7/16/85
		7/30/85

TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584

PCB ASSEMBLY- A3 METER BD.

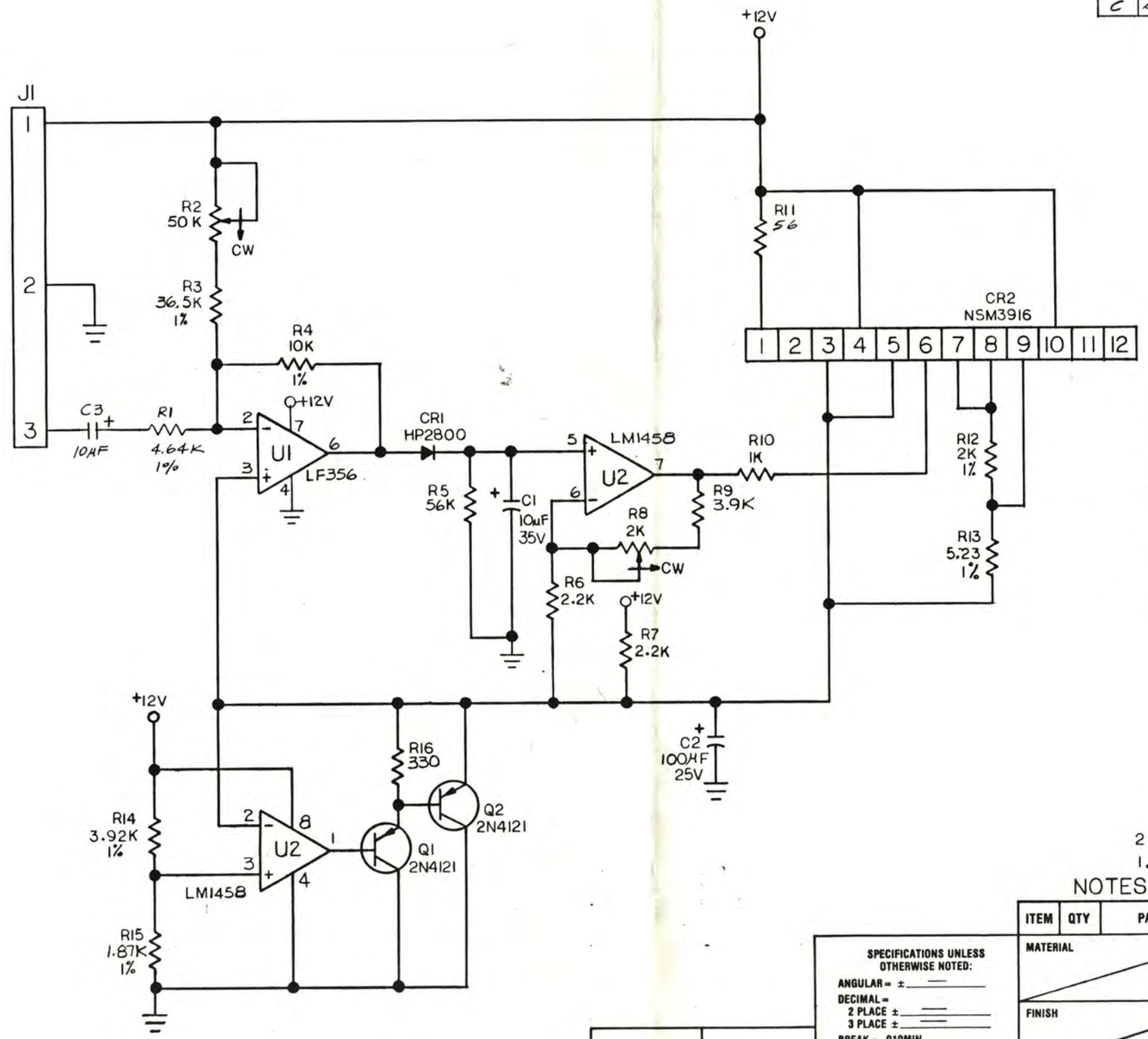
CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	D	6608-3395	D
SCALE 2/1	DO NOT SCALE PRINT	SHEET 1 OF 1	

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
C1	CAP ELECT 25V 100MF	2	1010-0111
C2	CAP ELECT 25V 100MF		1010-0111
C3	CAP ELECT 50V 1MF	17	1010-0009
C4	CAP ELECT 50V 1MF		1010-0009
C5	CAP ELECT 50V 1MF		1010-0009
C6	CAP ELECT 50V 1MF		1010-0009
C7	CAP ELECT 50V 1MF		1010-0009
C8	CAP ELECT 50V 1MF		1010-0009
C9	CAP POLY 1500PF 33VDC	1	1003-9153
C10	CAP ELECT 50V 1MF		1010-0009
C11	CAP ELECT 50V 1MF		1010-0009
C12	CAP ELECT 50V 1MF		1010-0009
C13	CAP ELECT 50V 1MF		1010-0009
C14	CAP ELECT 25V 10MF	5	1010-0099
C15	CAP ELECT 25V 10MF		1010-0099
C16	CAP ELECT 50V 1MF		1010-0009
C17	CAP ELECT 50V 1MF		1010-0009
C18	CAP ELECT 25V 100MF	1	1010-0110
C19	CAP ELECT 50V 1MF		1010-0009
C20	CAP ELECT 50V 1MF		1010-0009
C21	CAP TANT 35V 4.7MF	1	1008-0047
C22	CAP ELECT 50V 1MF		1010-0009
C23	CAP ELECT 50V 1MF		1010-0009
C24	CAP CER DISC .01MF	6	1005-1039
C25	CAP CER DISC .01MF		1005-1039
C26	CAP CER DISC .01MF		1005-1039
C27	CAP CER DISC .01MF		1005-1039
C28	CAP ELECT 50V 1MF		1010-0009
C29	CAP CER DISC .01MF		1005-1039
C30	CAP CER DISC .01MF		1005-1039
C31	CAP ELECT 25V 10MF		1010-0099
C32	CAP ELECT 25V 10MF		1010-0099
C33	CAP ELECT 25V 4700MF	1	1010-0472
C34	CAP ELECT 25V 10MF		1010-0099
K2	DIODE BRIDGE VM18	1	1284-0004
R1	RES CAR COMP 1/4W 5% 100K	7	1065-1003
R2	RES CAR COMP 1/4W 5% 10K	12	1065-1002
R3	RES CAR COMP 1/4W 5% 100K		1065-1003
R4	RES CAR COMP 1/4W 5% 10K		1065-1002
R5	RES MT FLM 1/8W 1% 10K	7	1061-1002
R6	RES MT FLM 1/8W 1% 10K		1061-1002
R7	RES CAR COMP 1/4W 5% 100	17	1065-0100
R8	RES CAR COMP 1/4W 5% 100		1065-0100
R9	RES MT FLM 1/8W 1% 10K		1061-1002
R10	RES CAR COMP 1/4W 5% 100		1065-0100
R11	RES CAR COMP 1/4W 5% 100		1065-0100
R12	RES MT FLM 1/8W 1% 8.45K	2	1061-8451
R13	RES MT FLM 1/8W 1% 8.45K		1061-8451
R14	RES MT FLM 1/8W 1% 10K		1061-1002
R15	RES MT FLM 1/8W 1% 10K		1061-1002
R16	RES CAR COMP 1/4W 5% 100		1065-0100

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
R17	RES CAR COMP 1/4W 5% 100		1065-0100
R18	RES MT FLM 1/8W 1% 49.9K	3	1061-4992
R19	RES MT FLM 1/8W 1% 49.9K		1061-4992
R20	RES MT FLM 1/8W 1% 49.9K		1061-4992
R21	RES CAR COMP 1/4W 5% 100		1065-0100
R22	RES CAR COMP 1/4W 5% 100		1065-0100
R23	POT VAR 1T 20K	2	1072-2002
R24	RES CAR COMP 1/4W 5% 27K	1	1065-2702
R25	RES CAR COMP 1/4W 5% 82K		1065-8202
R26	RES CAR COMP 1/4W 5% 100		1065-0100
R27	RES CAR COMP 1/4W 5% 10K		1065-1002
R28	RES CAR COMP 1/4W 5% 100		1065-0100
R29	RES CAR COMP 1/4W 5% 100K		1065-1003
R30	RES CAR COMP 1/4W 5% 100K		1065-1003
R31	RES VAR PC MT 1T 10K	4	1072-1002
R32	RES VAR PC MT 1T 10K		1072-1002
R33	RES MT FLM 1/8W 1% 10K		1061-1002
R34	RES MT FLM 1/8W 1% 10K		1061-1002
R35	RES CAR COMP 1/4W 5% 100		1065-0100
R36	RES CAR COMP 1/4W 5% 100		1065-0100
R37	RES MT FLM 1/8W 1% 20K	2	1061-2002
R38	RES MT FLM 1/8W 1% 20K		1061-2002
R39	POT VAR 1T 50K		1072-5002
R40	RES CAR COMP 1/4W 5% 75K	1	1065-7502
R41	RES MT FLM 1/8W 1% 5.62K	1	1061-5621
R42	RES MT FLM 1/8W 1% 8.25K	1	1061-8251
R43	RES CAR COMP 1/4W 5% 100K		1065-1003
R44	RES CAP COMP 1/4W 5% 10K		1065-1002
R45	RES MT FLM 1/8W 1% 10.2K	1	1061-1022
R46	RES CAR COMP 1/4W 5% 47	1	1065-0047
R47	RES CAR COMP 1/4W 5% 1K	3	1065-1001
R48	POT VAR 1T 1K	2	1072-1001
R49	RES CAR COMP 1/4W 5% 510	1	1065-0510
R50	RES CAR COMP 1/4W 5% 10K		1065-1002
R51	RES CAR COMP 1/4W 5% 100		1065-0100
R52	RES CAR COMP 1/4W 5% 100		1065-0100
R53	RES CAR COMP 1/4W 5% 5.6K	1	1065-5601
R54	RES CAR COMP 1/4W 5% 10K		1065-1002
R55	RES CAR COMP 1/4W 5% 1K		1065-1001
R56	RES CAR COMP 1/4W 5% 7.5K	1	1065-7501
R57	RES CAR COMP 1/4W 5% 10K		1065-1002
R58	RES CAR COMP 1/4W 5% 330	1	1065-0330
R59	RES CAR COMP 1/4W 5% 100		1065-0100
R60	RES CAR COMP 1/4W 5% 10K		1065-1002
R61	RES CAR COMP 1/4W 5% 100		1065-0100
R62	RES CAR COMP 1/4W 5% 2.4K	2	1065-2401
R63	RES CAR COMP 1/4W 5% 2.4K		1065-2401
R64	POT VAR 10T 5K	1	1069-5001
R65	POT VAR 1T 10K		1072-1002
R66	POT VAR 1T 10K		1072-1002
R67	POT VAR 1T 1K		1072-1001
R68	RES CAR COMP 1/4W 5% 220	1	1065-0220
R69	RES CAR COMP 1/4W 5% 10K		1065-1002

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
R70	RES CAR COMP 1/4W 5% 100		1065-0100
R71	RES CAR COMP 1/4W 5% 10K		1065-1002
R72	RES CAR COMP 1/4W 5% 10K		1650-1002
R73	RES CAR COMP 1/4W 5% 1K		1065-1001
R74	RES CAR COMP 1/4W 5% 10K		1065-1002
R75	RES CAR COMP 1/4W 5% 100K		1065-1003
R76	RES CAR COMP 1/8W 1% 10.7K	1	1061-1072
CR1	DIODE HP2800	3	1282-2800
CR2	DIODE HP2800		1282-2800
CR3	DIODE HP2800		1282-2800
CR4	NOT USED		
CR5	NOT USED		
J1	CONN MOLEX 4 PIN	1	2250-6004
J2	CONN MOLEX 14 PIN	2	2250-6014
J3	CONN MOLEX 14 PIN		2250-6014
J4	CONN MOLEX 8 PIN	1	2250-6008
J5	CONN MOLEX 2 PIN	1	2250-6002
J6	CONN MOLEX 3 PIN	1	2250-6003
J7	CONN MOLEX 6 PIN	1	2250-6006
L1	CHOKE RF 2 1/2T	2	1530-0025
L2	CHOKE RF 2 1/2T		1530-0025
Q1	TRANSISTORY 2N3565	1	1271-3565
S1	SWITCH SLIDE DPDT	2	1840-2200
S2	SWITCH SLIDE DPDT		1840-2200
S3	SWITCH P/B 7 STA. DPDT	1	1850-0027
U1	IC NE5534	3	1100-5534
U2	IC NE5534		1100-5534
U3	IC NE5534		1100-5534
U4	IC LF356	3	1100-0356
U5	IC LF356		1100-0356
U6	IC LF356		1100-0356
U7	IC MC1458	1	1100-1458
U8	IC LF353	1	1100-0353
U9	IC CA3140	1	1100-3140
	IC SOCKET 8 PIN	9	2250-1008
	SOLID PIN	16	2140-0071
	INSULATOR PLASTIC TO - 3	2	2140-0102
	WASHER PWP TRANSISTOR	2	2140-0137
	PCB	1	1600-3395

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
1	ENGR REL	DM	4/26/82	
A	RG NOT GND		12-16-82	
B	PROD. RELEASE		9-1-83	
C	REVISED PER ECO 1637	KC	4-13-84	



REFERENCE DESIGNATORS	
LAST USED	UNUSED
R16	
C3	
CR2	
U1	
Q2	

2 ALL CAPACITOR VALUES ARE IN MICROFARADS
1. ALL RESISTOR VALUES ARE IN OHMS 1/4W, 5%
NOTES: UNLESS OTHERWISE SPECIFIED

8300	6608-3348
MODEL	NEXT ASSY
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ±___
DECIMAL = 2 PLACE ±___ 3 PLACE ±___
BREAK = .010MIN
SURFACE ROUGHNESS = ___MICROINCHES RMS: MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = ___MAX
THREADS = CLASS 2 MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
MATERIAL			
FINISH			

DR. BY.	D.MILES	5/10/82
CK. BY.		5-27-83
ENGR.		9/8/83
MFG.		
Q.A.		

TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584

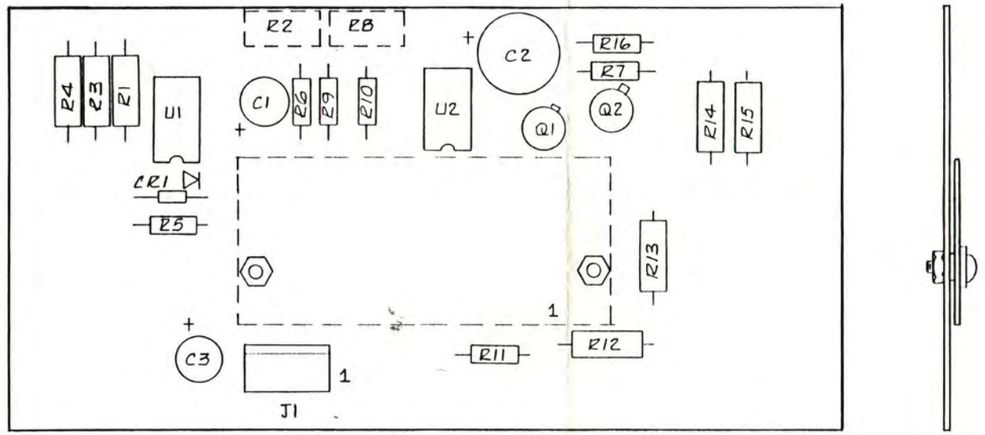
TRANSMITTER DISPLAY SCHEMATIC

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	C	6601-3348	C

SCALE ~ | DO NOT SCALE PRINT | SHEET 1 OF 1

FIGURE B9

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
1	ENGR. RELEASE		11-15-82	
A	R6 NOT GND		12-16-82	
B	PROD. RELEASE		9-1-83	
C	REVISED PER ECO 1637		4-13-84	
D	REVISED PER ECO 1684		9-30-85	



3. FOR SCHEMATIC SEE 6601-3348 (LATEST REV.)

2. FOR PCB SEE 1600-3348 (LATEST REV.)

1. FOR MATL LIST SEE 6608-3348 (LATEST REV.)

NOTES: UNLESS OTHERWISE SPECIFIED

MODEL	NEXT ASSY
8300	5102-3383
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ± —
DECIMAL =
2 PLACE ± —
3 PLACE ± —
BREAK = .010MIN
SURFACE ROUGHNESS = — MICROINCHES RMS: MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = — MAX
THREADS = CLASS 2 MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION

MATERIAL

FINISH

DR. BY	L. Ruckie	11-15-82
CK. BY.		
ENGR.		7/20/84
MFG.		7/19/84
Q.A.		7/16/84
	R. Kawamura	7/19/84

TFT INC
3090 OAKMEAD VILLAGE DR.
SANTA CLARA, CA. 95051
(408) 727-7272 TWX 910-338-0584

PCB ASSEMBLY-TRANSMITTER DISPLAY

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	C	6608-3348	D
SCALE 2:1	DO NOT SCALE PRINT	SHEET 1 OF 1	

Model 8300 Transmitter Display Assembly #6608-3348 Rev. D

CKT REF	DESCRIPTION	QTY	TFT STOCK NO.
R1	Resistor 1/8W 1% Mt. Film 4.64K	1	1061-4641
R2	Resistor Variable 50K IT	1	1072-5002
R3	Resistor 1/8W 1% Mt. Film 36.5K	1	1061-3652
R4	Resistor 1/8W 1% Mt. Film 10K	1	1061-1002
R5	Resistor 1/4W 5% Carbon Comp. 56K	1	1065-5602
R6	Resistor 1/4W 5% Carbon Comp. 2.2K	2	1065-2201
R7	Resistor 1/4W 5% Carbon Comp. 2.2K		1065-2201
R8	Resistor Variable 2K IT	1	1072-2001
R9	Resistor 1/4W 5% Carbon Comp. 3.9K	1	1065-3901
R10	Resistor 1/4W 5% Carbon Comp. 1K	1	1065-1001
R11	Resistor 1/4W 5% Carbon Comp. 56	1	1065-0056
R12	Resistor 1/8W 1% Mt. Film 2K	1	1061-2001
R13	Resistor 1/8W 1% Mt. Film 5.23K	1	1061-5231
R14	Resistor 1/8W 1% Mt. Film 3.92K	1	1061-3921
R15	Resistor 1/8W 1% Mt. Film 1.87K	1	1061-1871
R16	Resistor 1/4W 5% Carbon Comp. 330	1	1065-0330
C1	Cap. Electrolytic 10ufd 25v	2	1010-0099
C2	Cap. Electrolytic 100ufd 25v Vert. Mount	1	1010-0110
C3	Cap. Electrolytic 10ufd 25v		1010-0099
CR1	Diode HP2800	1	1282-2800
CR2	LED Bar Graph Display with Driver	1	1285-3916
Q1	Transistor 2N4121	2	1271-4121
Q2	Transistor 2N4121		1271-4121
U1	I.C. LF356N	1	1100-0356
U2	I.C. MC1458	1	1100-1458
	IC SOCKET 8PIN	2	2250-1008
J1	CONN 3PIN Molex	1	2250-6003
	Washer #4	2	2112-0040
	Screw PH 4-40 x 3/8	2	2104-0007
	Nut Kept 4-40	2	2111-0001
	Washer Blk	2	2112-0003
	Screw PH 4-40 x 1/4	1	2104-0001
	PCB	1	1600-3348

DRAWING NO. 6600-2271 REV. C

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	PROD. RELEASE	[illegible]	10-12-83	
B	REVISED PER ECO 1641	KE	5-8-84	
C	REVISED PER ECO 1663	KE	10-26-84	

A1

A1-A1

POWER AMP ASSY

- RED/BLK A1A2 E5 → FT1
- A2 RF OUTPUT A1A2 E1 RED → RF INPUT
- FT2
- A1A2 E2
- FT3 → BLU A1A2 E3
- FT4 → WHT/VIO A1A2 E4

A1-A2

POWER SUPPLY ASSY

- A1A1 FT2 → E1
- A1A1 (GND LUG) → E2
- J1 (1 2) → P1

PIN	TO	
1	C1 + TRANSF.	RED
2	C1 − TRANSF.	BLK

- J2 (1 2 3 4 5 6) → P2
- E5 → A1A1 FT1
- E4 → A1A1 FT4
- E3 → A1A1 FT3

PIN	TO	
1	A3J7-1 METER BD	ORG
2	A3J7-2	YEL
3	A3J7-3	GRN
4	A3J7-4	BLU
5	A3J7-5	VIO
6	A3J7-6 METER BD	GRY

LINE FILTER: L O, N O, J O, A O, B O, C O, D O, E O, F O

A2

CASTING ASSY

- METER BD A3J3-2 → MODULATION INPUT
- METER BD A3J3-1
- A1A1 INPUT
- RF OUTPUT

NOT USED	FT1 OUT VCO LEVEL	
ORG	FT2 −12V	
VIO	FT3 OUT VCO ØV	
RED	FT4 +12V	
BLU	FT5 +12S	
WHT	FT6 1 WT LVL	
SMPL Ø LVL	FT12	NOT USED
SMPL ØV	FT11	GRN/YEL
LED	FT10	WHT/GRN
VCO LVL	FT9	WHT/YEL
VCO ØV	FT8	GRY
1 WT SWITCH	FT7 GND	WHT/VIO

PIN	TO
FT1	A3J2-5 METER BD
FT2	A3J2-2
FT3	A3J2-6
FT4	A3J2-3
FT5	A3J2-4
FT6	A3J2-7
FT7	A3J2-1
FT7	A3J2-13
FT8	A3J2-12
FT9	A3J2-11
FT10	A3J2-10
FT11	A3J2-9
FT12	A3J2-8 METER BD

A3

METER BD. ASSY

- J1 (P1: 1 2 3 4)
- J2 (P2: 1 2 3 4 5 6 7 8 9 10 11 12 13 14) → P3
- J3 (P3: 1 2 3 4 5 6 7 8 9 10 11 12 13 14) → P4
- J4 (P4: 1 2 3 4 5 6 7 8) → P5
- J6 (P5: 1 2) → P6
- J7 (P6: 1 2 3) → P7
- P7: 1 2 3 4 5 6

PIN	TO	
1	T1 (RED WIRE)	RED/WHT
2	C1 −	BLK
3	T1 (GRY WIRE)	WHT/BLK
4	C1 +	RED

PIN	TO	
1	A2 FT7 GND CASTING	BLK
2	A2 FT2 CASTING	BLU
3	A2 FT4	BLU
4	A2 FT5	BLU
5	A2 FT1	RED
6	A2 FT3	VIO
7	A2 FT6	GRY
8	A2 FT12	GRY
9	A2 FT11	GRN/YEL
10	A2 FT10	WHT/GRN
11	A2 FT9	WHT/YEL
12	A2 FT8	GRY
13	A2 FT7 CASTING	WHT/VIO
14	NOT USED	

PIN	TO	
1	FPS1-2 FRONT PANEL	BLK
2	LED ANODE	BLU
3	METER −	BLK
4	METER LIGHT	RED/WHT
5	METER LIGHT	BLK
6	METER +	VIO
7	NOT USED	
8	FPS1-1	GRY
9	A4J1-1	BLU
10	NOT USED	WHT/RED
11	A4J1-3	VIO
12	LED CATHODE	GRN/YEL
13	A4J1-2	GRY
14	FPS1-3 FRONT PANEL	BLK

PIN	TO	
1	CHJ4-B REMOTE	WHT/BLK
2	CHJ4-A	WHT/RED
3	CHJ4-E	WHT/GRN
4	CHJ4-D REMOTE	WHT/VIO
5	CHJ2-LUG (GND)	BLK
6	CHJ2-MUX 1	WHT
7	CHJ1-LUG (GND)	BLK
8	CHJ1-MUX 2	WHT

PIN	TO	
1	CHJ5 + BALANCE	RED
2	CHJ5 LUG BALANCE	ORG
3	CHJ5 − BALANCE	BLK

PIN	TO	
1	A1A2 J2-1 PWR SUPP	ORG
2	A1A2 J2-2 PWR SUPP	YEL
3	A1A2 J2-3 P.S. GND	GRN
4	A1A2 J2-4 PWR PWR	BLU
5	A1A2 J2-5	VIO
6	A1A2 J2-6	GRY

PIN	TO
1	A2 MODULAT. GND
2	A2 MODULAT. IN

C1 (+ −)
- A3J1-4 METER BD
- A1A2 J1-1 POWER SUPP. BD
- A3J1-2 METER BD
- A1A2 P1-2 POWER SUPP. BD

K1 (1 2 3 4)

T1
- WHT
- YEL
- ORN
- BLK
- RED
- RED
- GRY → A3J1-1 METER BD
- GRY → A3J1-3 METER BD

A3J3-12, A3J3-2

RF POWER ON SWITCH
- 1 → A3J3-14 METER BD
- 2 → A3J3-1 METER BD
- 3 → A3J3-8 METER BD

A4

BARGRAPH DISPLAY ASSY

J1 (P1: 1 2 3)

PIN	DESCRIPTION	WIRE COLOR
1	A3J3-9 METER BD	YEL
2	A3J3-11 METER BD	GRN
3	A3J3-13 METER BD	GRN

METER BD

- A3J4-6 ORG COAX → CHJ1 MUX 1
- A3J4-5
- A3J4-8 BRN COAX → CHJ2 MUX 2
- A3J4-7
- A3J6-1 RED → CHJ3 PROG. INPUT
- A3J6-2
- A3J6-3

CHJ4 REMOTE INPUT

PIN	TO
A	A3J4-2 METER BD
B	A3J4-1
E	A3J4-3
D	A3J4-4 METER BD

METER

METER BD A3J3-7, A3J3-4

- A3J3-5 METER BD
- A3J3-3
- A3J3-6

METER BD

B300	
MODEL	NEXT ASSY
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ±
DECIMAL = 2 PLACE ± 3 PLACE ±
BREAK = .010MIN
SURFACE ROUGHNESS = MICROINCHES RMS. MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = MAX
THREADS = CLASS 2
MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
MATERIAL			TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910 338-0584
FINISH			WIRING DIAGRAM 8300
DR. BY		L. Machine 10-12-83	
CK. BY			CODE IDENT NO.
ENGR.		J. Jones 10/31/83	SIZE D
MFG.		[illegible] 11/1/84	DRAWING NO. 6600-2271
Q.A.		[illegible] 11/16/84	REV. C
			SCALE —
			DO NOT SCALE PRINT
			SHEET 1 OF 1

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Model 8300 Assy Name: System Wiring Diagram Assy No. 6600-2271 Rev. C

CKT REF	DESCRIPTION	QTY	TFT STOCK NO.
	Filter Fuse Holder	1	1910-0006
	Fuse - 15A SB	1	1900-0012
	XFMR Power Toroid	1	1501-0009
	Switch - SPDT Blk	1	1800-7162
	LED Grn 5082-4950	1	1285-4950
	LED MV 5025	1	1285-5028
	Meter - Xmtr	1	1400-0060
	Lamp - Meter	2	2300-7382
CHJ5	Terminal Blk 3 POS	1	1700-0174
CHJ3	Conn RF BNC Insulated	1	2200-3110
CHJ2, CHJ	Conn RF BNC Ch. Mt.	2	2200-7935
CHJ4	Socket 9 PIN	1	2250-0009
C1	Cap Elect. 20000 MF	1	1010-2002
K1	Rectifier Brg MDA801	1	1284-0801

P/N 5004-7770

REVISION A

TFT

MODEL 7770 TRANSMITTER AUTOMATIC CHANGEOVER

PART C

TFT, Inc.
3090 Oakmead Village Drive
Santa Clara, CA 95051
(408) 727-7272

TABLE OF CONTENTS

SECTION C1

GENERAL INFORMATION

C1.1 General Description

The Model 7770 Transmitter Automatic Changeover is used in an STL Hot Standby Transmitter System to automatically switch from the primary transmitter to the standby transmitter whenever there is a failure in the primary. Front-panel switches also enable the operator to manually switch between transmitters. A rear-panel terminal strip provides outputs to drive an external status indicator or alarm.

The Model 7770 is 1-3/4" high and mounts in a standard 19-inch relay rack at the studio.

C1.2 Specifications

RF Input	100 W maximum. Type N female connector.
External Alarm Output	Positive 50 V maximum, sink 250 mA maximum.
Transmitter Control	SPDT contact closure, 1 A at 26 V DC.
Power Required	120/240 V AC, 10 W maximum, 50-60 Hz.
Temperature Range	-10°C to 50°C.

SECTION C2

INSTALLATION

Installation instructions for the 7770 Transmitter Automatic Changeover are contained in Section A2 of Part A of this manual.

SECTION C3

OPERATION

Operating instructions for the 7770 Transmitter Automatic Changeover are contained in Section A3 of Part A of this manual.

SECTION C4

THEORY OF OPERATION

C4.1 General

The Model 7770 Transmitter Automatic Changeover monitors the RF power output and synthesizer lock circuits of the two transmitters, and transfers operation to the standby unit if there is a failure in the operating unit. Provision is also made for switching the transmitters manually by means of front-panel pushbuttons; such manual switching overrides the automatic switching. In the AUTO mode, Transmitter No. 1 is selected as the operating transmitter when power is first applied to the unit.

C4.2 PC Board Schematic Diagram Discussion (Drawing No. 6601-3230)

When power is first applied to the board, the charging current through C2 will turn on Q1. If front-panel AUTO switch S1-E is closed (thus opening S1-D and S1-C), Q1 will energize K1, and contacts K1-A will energize coaxial antenna relay K2, connecting the antenna to Transmitter No. 1. Contacts K1-B connect the grount at J5 pin E to J5 pin D, which is applied to P1-19 (Remote Input in Model 7730 Transmitter) of Board A4 of Transmitter No. 1 to turn on power to its Upconverter (2-Watt Driver in the Model 7730 Transmitter), and thus turn on the RF output from Transmitter No. 1.

When Transmitter No. 1 starts delivering RF power, P1-2 (P1-14 for Model 7730 Transmitter) on the transmitter Board A4 will go high provided all transmitter synthesizer circuits have locked. This high, which is brought into the Transmitter Automatic Changeover at J5-B, holds Q1 on after C2 has charged and thus keeps K1 and K2 energized. Transmitter No. 2 will not be turned on because J6-D will not be grounded, thus removing power from the transmitter's Upconvertor (or 2-Watt Driver).

If Transmitter 1 fails (loss of synthesizer lock or loss of RF output), J5-B will go low, turning off Q1 and thus de-energizing K1 and K2. The antenna will now be connected to Transmitter No. 2 through the contacts of K2; and J6-D will be grounded, turning on the Upconverter (or 2-Watt Driver) of Transmitter No. 2 through P1-19 (or Remote Input) of its Power Supply Board A4.

If Transmitter 2 fails after it has been selected as the operating transmitter, P1-2 (or P1-14) of its Board A4 will go low. This low is applied through J6-B of the Transmitter Automatic Changeover and

comparator U1 to the base of Q2, turning it off. The resulting high at the collector of Q2 causes Q1 to energize K1 and K2, transferring operation to Transmitter No. 1. The time constant of C4 and R9 keeps the relays energized until Transmitter No. 1 delivers a high to J5-B.

Pressing front-panel XMTR ON 1 switch S1-C will energize K1 and K2 and thus lock in Transmitter No. 1 as the operating transmitter. Pressing XMTR ON 2 switch S1-D will open both S1-E and S1-C, thus deenergizing K1 and K2 and locking in Transmitter No. 2 as the operating transmitter.

Green LED CP5 (AC POWER) lights whenever +8V is delivered by regulator U2. Green LED CR2 (XMTR 1 RADIATE) lights when relay K1 turns on Transmitter No. 1, and red LED CR6 (XMTR 2 RADIATE) lights when K1 turns on Transmitter No. 2.

If Transmitter No. 1 is the operating transmitter in the AUTO mode, the changeover operation and Transmitter No. 2 can be tested by pressing front-panel XMTR TEST 2 switch S1-B. This turns off Q1, de-energizing K1 and K2 and thus transferring operation to Transmitter No. 2.

If Transmitter No. 2 is the operating transmitter in the AUTO mode, pressing XMTR TEST 1 switch S1-A will energize K1 and K2 through Q2 and Q1, transferring operation to Transmitter No. 1 and thus verifying the operation of the Transmitter Automatic Changeover and Transmitter No. 1.

Relay contacts K1-A are connected to terminal board J4 for operating an external alarm or status indicator. The contacts will handle 150 mA maximum at 50 V.

SECTION C5

MAINTENANCE

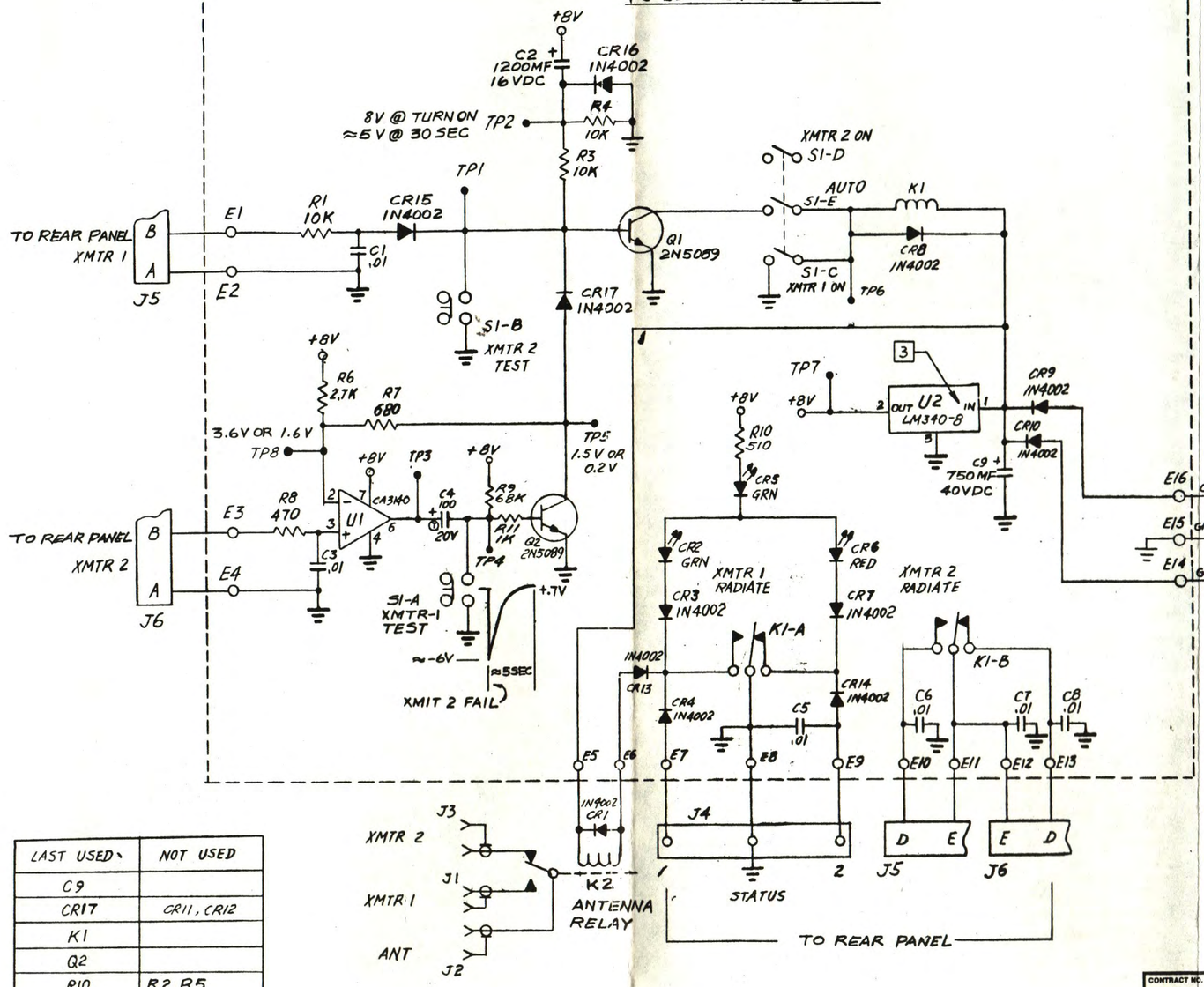
Maintenance instructions for the Model 7770 Automatic Changeover are contained in Section B5 of Part B of the manual.

SECTION C6

MODEL 7770 AUTOMATIC CHANGEOVER DIAGRAMS

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	RELEASED FOR PRODUCTION		
	B	REVISE PER ECO	10/3/79	
	C	REV PER ECO 1113	A.C. 5-1-80	
	D	REV PER ECO 1479		

PC BD ASSY 6608-3230



LAST USED	NOT USED
C9	
CR17	CR11, CR12
K1	
Q2	
R10	R2, R5
S1	
U2	
E16	

NOTES: UNLESS OTHERWISE SPECIFIED,

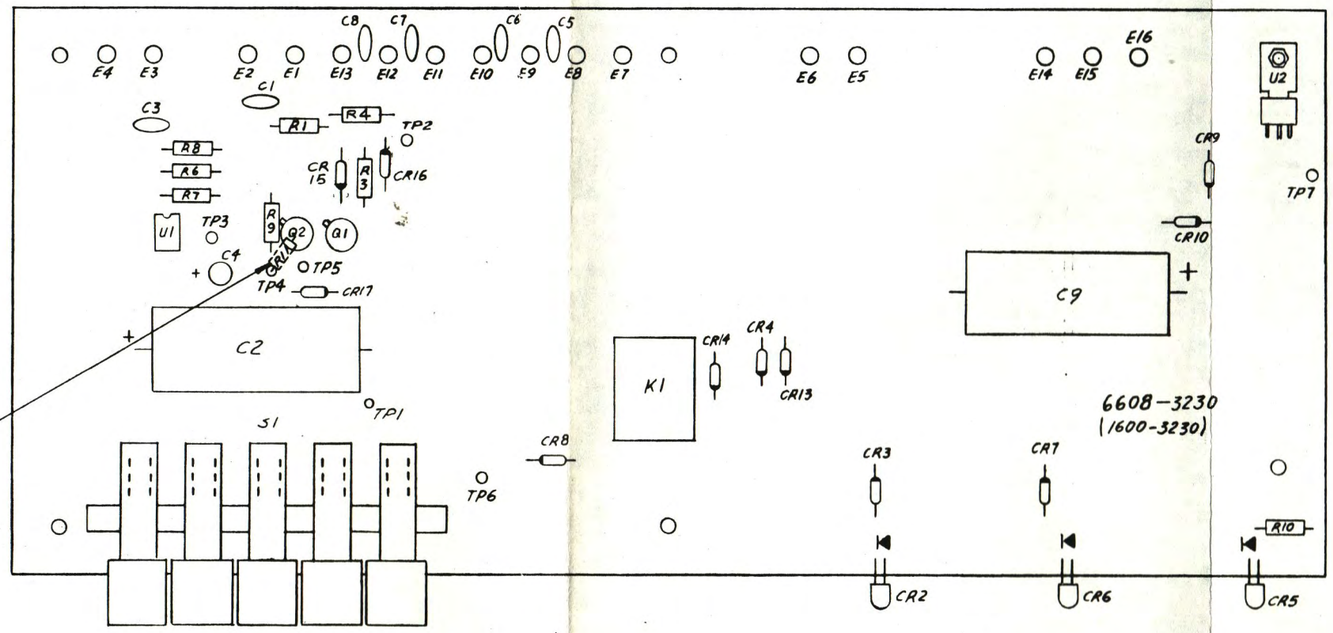
1. RES, 1/4 W. IN OHMS
2. CAPS, 25 VDC, IN MF
3. CHASSIS USED AS HEAT SINK FOR U2
4. FUSE IS AN INTEGRAL PART OF FILTER SWITCH AND SHOULD BE 0.5A/120V, 0.25A/240V.
5. PARTS OUTSIDE DOTTED LINE NOT ON PCB.

CONTRACT NO.		TIME & FREQUENCY TECHNOLOGY INC.		
APPROVALS	DATE	TRANSMITTER MODEL 7770 TRANSFER SYSTEM FIG 6.12		
DRAWN Anna Chen	5-9-79			
CHECKED	5-14-9	SIZE C	FSCM NO.	DWG. NO. 6601-3230 REV. D
ISSUED	9/26/79	SCALE NONE		SHEET 1 OF 1

DWG. NO. 6601-3230 SH. 1 REV. D

BISHOP GRAPHICS/ACCUPRESS
REORDER NO. A-4107

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	RELEASED FOR PRODUCTION	6-19-79	
	B	REVISED PER ECO 887	10/3/79	
	C	REV PER ECO 1114	5/1/80 A.C.	
	D	REV PER ECO 1198	5/29/80 A.C.	
	E	REVISED PER ECO 1479	2/24/82	



NOTE:

1. REF; SCHEMATIC 6601-3230
   P.C. BOARD 1600-3230
2. CUT TRACE BETWEEN R9 AND BASE OF Q2 AND ADD RESISTOR R11 (ON CIRCUIT, BOTTOM SIDE OF BOARD) BETWEEN BASE OF Q2 AND TP4.

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION

PARTS LIST

5102-3276	7770
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± ~ DECIMALS .XX ± ~ .XXX ± ~ ANGLES ± ~

MATERIAL ~

FINISH ~

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN Anna Chou	6-20-79
CHECKED [illegible]	6-20-79
ISSUED	
PROJ ENGR [illegible]	9/6/79
MFG ENGR	
QA [illegible]	10/3/79

TIME & FREQUENCY TECHNOLOGY INC.

PC BD ASSY
MODEL 7770 TRANSMITTER
TRANSFER SYSTEM

SIZE	FSCM NO.	DWG. NO.	REV.
C		6608-3230	E

SCALE 1:1 SHEET 1 OF 1

DWG. NO. 6608-3230 SH 1 REV E

CKT REF	DESCRIPTION	QTY	TFT STOCK NO.
C1	Cap Cer Disc .01MFD	1	1005-1039
C2	Cap Elect 1200MFD 15V	1	1010-1201
C3	Cap Cer Disc .01MFD	1	1005-1039
C4	Cap Tan 100MFD 20V	1	1008-0102
C5	Cap Cer Disc .01MFD	1	1005-1039
C6	Cap Cer Disc .01MFD	1	1005-1039
C7	Cap Cer Disc .01MFD	1	1005-1039
C8	Cap Cer Disc .01MFD	1	1005-1039
C9	Cap Elect 750MFD 40V	1	1010-0751
CR1	Not Used		
CR2	LED Grn 5082-4950	1	1285-4950
CR3	DIO IN4002 Rect	1	1284-4002
CR4	DIO IN4002 Rect	1	1284-4002
CR5	LED Grn 5082-4950	1	1285-4950
CR6	LED Red 5082-4403	1	1285-4403
CR7	DIO IN4002 Rect	1	1284-4002
CR8	DIO IN4002 Rect	1	1284-4002
CR9	DIO IN4002 Rect	1	1284-4002
CR10	DIO IN4002 Rect	1	1284-4002
CR11	Not Used		
CR12	Not Used		
CR13	DIO IN4002 Rect	1	1284-4002
CR14	DIO IN4002 Rect	1	1284-4002
CR15	DIO IN4002 Rect	1	1284-4002
CR16	DIO IN4002 Rect	1	1284-4002
CR17	DIO IN4002 Rect	1	1284-4002
K1	Relay AZ531-09-1	1	1880-0010
Q1	Trans 2N5089	1	1271-5089
Q2	Trans 2N5089	1	1271-5089
R1	Res Car Comp 1/4W 5% 10K	1	1065-1002
R2	Not Used		
R3	Res Car Comp 1/4W 5% 10K	1	1065-1002
R4	Res Car Comp 1/4W 5% 10K	1	1065-1002
R5	Not Used		
R6	Res Car Comp 1/4W 5% 2.7K	1	1065-2701
R7	Res Car Comp 1/4W 5% 680	1	1065-0680
R8	Res Car Comp 1/4W 5% 470	1	1065-0470
R9	Res Car Comp 1/4W 5% 68K	1	1065-6802

Model 7770 Transmitter Transfer System Assembly #6608-3230
Rev E

CKT REF	DESCRIPTION	QTY	TFT STOCK NO.
R10	Res Car Comp 1/4W 5% 510	1	1065-0510
R11	Res Car Comp 1/4W 5% 1K	1	1065-1001
S1	Switch 2 Pos MOM 3 Pos Latch	1	1850-2005
U1	I/C CA3140	1	1100-3140
U2	I/C LM340-8	1	1100-4080
	Tyton, Qwk Tie	2	2140-0004
	Socket I/C 8 Pin	1	2250-1008
	Schematic	Ref	6601-3230
	P C Board	1	1600-3230

P/N 5004-8301B
REVISION G
DATE JUNE 87
EQUIPMENT S/N _____
SHIPMENT DATE _____

T F T

MODEL 8301B STL RECEIVER

PART D

TFT, INC.
3090 Oakmead Village Drive
P.O. Box 58088
Santa Clara, CA 95052
(408) 727-7272 TWX 910-338-0584
FAX (408) 727-5942

PART D

Model 8301B

940 - 960 MHz STL Receiver

TABLE OF CONTENTS

DWG NO.

SECTION D 6 DIAGRAMS

SECTION D1

GENERAL INFORMATION

D1.1 General Description

The TFT 8301B Series STL Receiver is a crystal-controlled, triple-conversion, FM superheterodyne, FM Composite receiver for use at the transmitter site in an STL System.

All of the receivers are 3 1/2" high and mount in a standard 19-inch rack. The circuitry, except for major power supply components, is contained on a number of printed circuit boards, most of which are in an RF casting. Operation of the printed-circuit board circuits is described in detail in subsection 4.3.

D1.2 Specifications

RF Input Connector	50 ohm, Type "N" female
Sensitivity (75 usec de-emphasized)	20 uV for 55 dB Signal-to-Noise ratio 100 uV for 70 dB Signal-to-Noise ratio 500 uV for 80 dB Signal-to-Noise ratio (with 400 Hz high pass filter)
Selectivity (3 dB BW)	±200 kHz Min. (WB); ±75 kHz Min. (NB)
Selectivity (60 dB BW)	±1.0 MHz Max. (WB); ±500 kHz Max. (NB)
AM Rejection (400 Hz @ 10%)	55 dB Min.
Spurious and Image Rejection	60 dB Min.
Demodulated Outputs Program	+4 dBm (1.24 V RMS) into 600 ohms, unbalanced, 50 Hz to 75 kHz.
Multiplex	-3.7 dBm (0.50 V RMS) into 600 ohms, unbalanced, 110 to 220 kHz bandpass
Harmonic Distortion	0.2% Max. (WB)
Stereo Separation	50 dB from 50 Hz to 15 kHz (WB) >45 dB from 50 Hz to 7.5 kHz (NB) >40 dB from 7.5 kHz to 15kHz (NB)

D1.2 Specifications, Continued

Crosstalk	
Main to Sub	50 dB Min.
Sub to Main	50 dB Min.
Baseband Response	
±0.1 dB	50 Hz to 60 kHz (WB), 50 Hz to 15kHz (NB)
±0.5 dB	20 Hz to 75 kHz (WB), 20 Hz to 53kHz (NB)
Alarm Output (open collector)	Relay Contact Closure
Temperature Range	-10°C to +50°C
Power Requirements	120/240 V AC, 50-60 Hz, 12 W
Dimensions	3 1/2" (8.9 cm) H x 19" (48.3 cm) W x 15.5" (39.4 cm) D
Weight	10 1/2 lbs.

SECTION D4

THEORY OF OPERATION

D4.1 General

The Model 8301B is a triple-conversion, FM receiver operating in the frequency range of 940 to 960 MHz. It provides a composite audio signal output plus two multiplex outputs for program or control signals.

D4.2 Block Diagram Discussion (Figure D-1)

The RF signal, enters the receiver from either an antenna or an optional Model 7773 Automatic Changeover unit. The signal is fed into a coaxial filter having a 20 MHz 1 dB bandwidth which serves as a preselector. From the filter, the signal is applied to a switchable attenuator controlled by the front-panel RF GAIN switch. In the HIGH position, the attenuator has zero loss; in the LOW position, a 10dB loss.

The signal out of the attenuator is amplified by approximately 18 dB in a low noise two-transistor preamplifier before entering the first mixer. The attenuator, preamplifier, and first mixer are all located on the Front End Board. Another 6 dB of amplification is provided after the first mixer, so the overall gain of the Front End Board is approximately 24 dB.

The LO input for the first mixer comes from a VCO in a sampling phase-locked loop. The VCO frequency is controlled by a crystal oscillator operating at 1/10 the VCO frequency. The resulting LO output is 63 MHz below the received RF. The 63 MHz IF from the first mixer is fed to a 63 MHz IF amplifier. This amplified output is then fed to the IF Board.

The IF Board input is amplified by a second 63 MHz IF Amplifier and then fed to a Surface Acoustical Wave (SAW) Filter. This filter has a bandwidth of 400 kHz and provides superior selectivity without phase distortion. From the SAW filter, the 63 MHz signal is fed through a third 63 MHz IF amplifier to the second mixer. The LO input for the second mixer comes from the second LO which is a crystal oscillator operating at 73.7 MHz. The 10.7 MHz output of the second mixer is fed to a narrow-band filter having a bandwidth of 180 kHz, or a low-pass wideband filter. Output from either the narrow or wideband filter is selected by the front panel IF Bandwidth switch and fed to the third mixer. The LO input for the third mixer comes from the third LO which is a crystal oscillator operating at 9.85 MHz. The 850 kHz output of the third mixer is fed to a low-pass filter, an 850 kHz IF Amplifier, and an output buffer. The buffer output then feeds the 850 kHz input of the MAIN Board. A DC voltage is developed by the 850 kHz IF Amplifier and fed to a buffer. The buffer output is the squelch output of the IF Board and is fed to the MUTE Comparator on the MAIN Board.

D4.2 Continued

The second LO (73.7 MHz) also feeds the signal strength mixer. This mixer develops a 10.7 MHz output which is fed to a band-pass filter and a 10.7 MHz IF Amplifier. The Signal Strength output of the IF Amplifier is fed to a buffer and then to an inverting adjustable gain amplifier. The amplifier output is the signal strength output of the IF Board and is fed to the display board.

The 850 kHz IF Signal is fed to the Pulse Counting Discriminator on the MAIN Board. One discriminator output feeds a switching amplifier, and a 75 kHz Low-Pass filter. The resultant audio signal is amplified and fed to a balanced output amplifier which provides composite, and balanced composite output signals and finally, is fed to the display board. The second discriminator output feeds the two multiplex filters which, in turn, provides the two multiplex outputs. All these output signals pass through the normally closed contacts of Relay K1. Operation of K1 is controlled by the MUTE Comparator. If the squelch voltage to the comparator drops below a predetermined level, relay K1 contacts will open, muting the output signals.

The program signal, multiplex signals, and the power supply voltages are fed to front panel selector switches. Program and multiplex signals are rectified, filtered and become DC voltages fed to the meter amplifier. Power supply voltages are appled to the meter amplifier unchanged. The meter amplifier drives the front panel meter.

The program audio output is rectified and compared with a preset reference level on the Receiver Display Board. The output of the comparator is fed to a bargraph display on the front panel to indicate modulation percentage from 70 to 120 percent. The AGC is also compared with preset reference levels on the Display Board to turn on front panel LEDs when the signal level exceeds the preset levels.

D4.3 Schematic Diagram Discussions

D4.3.1 Main Board (Figure D2)

The Main Board contains the demodulator for the 850 kHz IF, metering circuits, muting circuits, and power supply rectifiers and regulators. It delivers the program and multiplex signals to the rear panel connectors, and inputs to the front panel meter.

The 850 kHz frequency modulated signal from the casting enters the Main Board at J2. The signal goes directly to U1. The signal is limited in U1, and then each cycle of the signal triggers one-shot U2 which functions as a pulse counting discriminator. The pulse train at the output of U2 (pin 4) goes through a switching amplifier (Q3 through Q6) to reduce distortion, and then through linear-phase lowpass filter FL1, which extracts the low frequency (modulation) component from the pulse train.

D4.3.1 Continued

The audio output of FL1 goes through a matching network (C21, R27, R28) to amplifier U3. A filter (C30, C31, L5) at the output of U3 removes more of the 850 kHz signal. Phase-shift network R32/C27 compensates for any nonlinearities in the filter and provides excellent stereo separation. U4 is the output amplifier for the program audio, and U5 is an inverting amplifier to provide a balanced output.

The pulse train output at pin 13 of U2 (the complement of the pin 4 output) is fed the MUX 1 and MUX 2 filter amplifiers, which are tuned to extract the two multiplex signals from the output of the pulse counting discriminator.

The metering circuit consists of amplifier U9, peak detector CR4/C44, and amplifier U10 which drives the front panel meter. When one of the front panel METER FUNCTION switches is pressed, an input is supplied to the metering circuit through one section of S1. The -12V power supply voltage is inverted by U6 before being fed up to U9. The output of the MUX 1 filter amplifier is amplified by U8 before entering the metering circuit. No amplification is needed for the MUX 2 signal. The program audio and multiplex signals are rectified by CR4. R62 is used to calibrate the metering circuit for voltage levels, and R54, at the input of the progam amplifier, calibrates the meter for modulation percentage.

The muting circuit consists of comparator U11 and associated components. If the RF signal is too low for satisfactory reception, the squelch at pin 3 of J3 will be low. This will produce a low output at U11-6, which will ground the program input to U7 and thus disable the meter for modulation percentage readings.

When a normal signal is being received, the incoming DC at pin 3 of U11 will be high, so that pin 6 of U11 will be high and CR12 will be off. This turns on Q10, Q11, and Q8, energizing K1 which routes the program and multiplex signals to the rear panel connectors. If, however, the RF signal drops below a predetermined level, the rising squelch voltage will deenergize K1 and interrupt the program and multiplex signals.

Q7 is also driven by the output of U11 to energize an optional external relay when signal level is normal, and to deenergize it when the signal fails. The relay is connected to pin 11 of J5.

Front panel RF GAIN switch S2B switches $\pm$12V on and off to energize or deenergize the relay on the casting that switches the 10 dB attenuator in or out of the RF input.

D4.3.2 Front End Board (Figure D3)

The Front End Board includes a switchable attenuator, a preamplifier, the first mixer, and an output amplifier/filter.

The RF signal (940-960 MHz) from the coaxial filter enters the board at J1. If the front panel RF GAIN switch is in the LOW positon, relay K1 will be energized, and the signal will be routed through the 10 dB attenuator R1/R2/R3. In the HIGH position of the switch, K1 is deenergized, and the signal is routed directly to Q2.

D4.3.2 Continued

Amplifiers Q2 and Q4 provide approximately 18 dB of gain. Q1 and Q3 provide temperature compensated biasing for Q2 and Q4, respectively. The output of Q4 goes to Z1, where it is mixed with an input from the first LO to produce an IF of 63 MHz. The 63 MHz IF is passed through a bandpass filter (C17/C18/L5), amplified by Q5, and delivered to the 63 MHZ to 850 kHz IF Board.

D4.3.3 First Local Oscillator (Figure D4)

The first LO uses a sampling phase-locked loop to generate a frequency in the range of 877 to 897 MHz (63 MHz below the received signal frequency). Q7, Y1, and associated components make up a crystal oscillator operating at 1/10 the required LO frequency. Emitter follower Q6 and amplifier Q5 feed the crystal oscillator output into the primary of transformer T1. T1 drives step recovery diode CR6 in a X10 multiplier circuit. The output of the multiplier circuit, at the required LO frequency, is applied to one input of balanced mixer CR4/CR5. The other input to the mixer comes from voltage controlled oscillator Q4, whose nominal frequency is also the required LO frequency. If there is a difference in the two mixer input frequencies, a dc voltage is produced across the mixer's resistive load. This voltage is fed through adjustment potentiometer R28 and loop amplifier U1-7 to varicap CR3 in the tuned circuit of Q4. The error voltage causes the varicap to tune Q4 back to the required frequency. The output of Q4 is delivered to the Front End Board as the first LO input. The output is also rectified by CR8 so that its level can be checked at TP1.

The loop error voltage can be monitored at the LO pin shown at the left side of the schematic. Circuits associated with U1-1, Q1, Q2, and Q3 are not used in the 8301 Receiver.

D4.3.4 63 MHz to 850 kHz IF Board (Figure D5)

This board, located in the casting, contains the second mixer, second LO, third mixer, third LO, signal strength mixer and various amplifiers and filters.

The 63 MHz IF signal from the Front End Board is amplified by U1, fed to the SAW filter FL1, and again amplified by U2. U1 compensates for the filter insertion loss. The 63 MHz signal from U2 is then fed to the Mixer/Filter Board. The signal is mixed in U1 with the output of the second LO (Q1) operating at 73.7 MHz. The resultant 10.7 MHz signal is fed to the wide, or the narrow band filter. The filtered 10.7 MHz signal is then mixed with a 9.85 MHz LO signal in mixer-oscillator U5. The resultant 850 kHz signal from U5 is fed to a low pass filter, amplified by the third IF amplifier U6, and finally fed to TTL Level Translator Q2 and Q3. The 850 kHz signal is now fed to the Main Board.

The DC squelch voltage is developed by a third IF amplifier U6, buffered by U8 and fed to the Main Board.

Output from the second LO (73.7 MHz) is also fed to the Signal Strength Mixer U3. The resultant 10.7 MHz signal is fed to a 10.7 MHz Band Pass Filter and amplified by third IF amplifier U4. The Signal Strength Component is buffered by U7A and finally fed to adjustable gain amplifier U7B. The output of U7B is then fed to the Display Board.

SECTION D5

MAINTENANCE
STL RECEIVER

D5.1 General

Once installed, the TFT Series STL Receiver should require little maintenance. The units should be installed away from vacuum tubes and other heat generating equipment, and the Model 8301 Receiver should be provided with adequate ventilation.

D5.2 Access

To gain access to circuit assemblies and top-of-chassis components, remove the top cover.

To remove the receiver module from the chassis, remove the top cover and pull the module.

D5.3 Periodic Maintenance

Once installed, the only maintenance necessary is a periodic proof of performance check of the system to assure optimum operation.

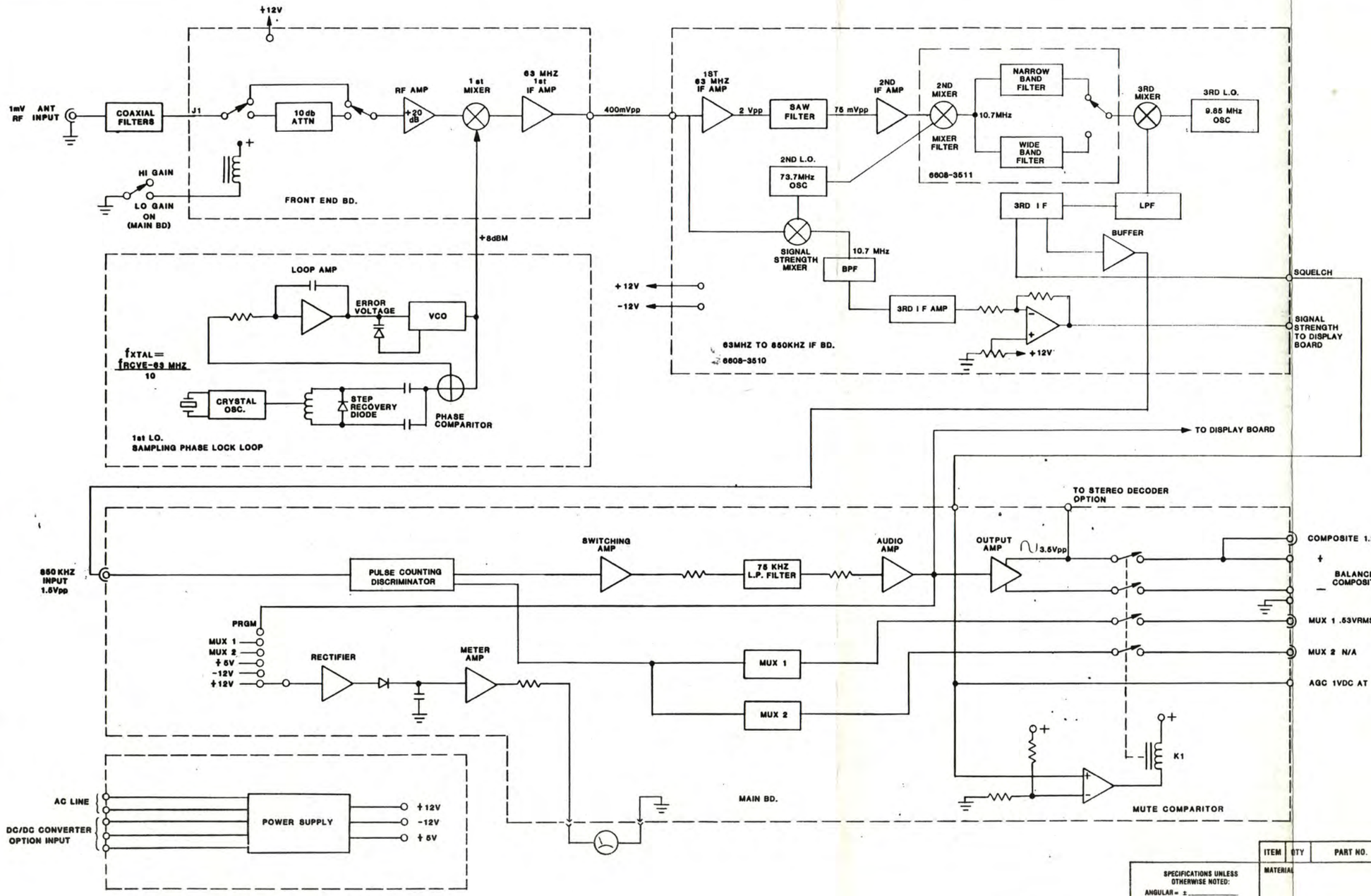
The performance of the STL transmitter and receiver units can be easily and quickly checked with the front panel multimeter. Following installation of the STL system, the operational front panel meter readings for each position of the meter selector switch should be recorded. This gives a quick and accurate check of system performance by allowing a comparison of present operation to its operation when new. Gradually changing readings can be quickly spotted by this method, and used to forestall developing problems.

Note

To prevent damage to receiver circuits, the input ac power should be disconnected when removing or replacing PC Boards.

DWG. NO 6600-2377 SH REV

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	PROD. RELEASE	KE	5/2/06	



SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ±
DECIMAL =
2 PLACE ±
3 PLACE ±
BREAK = .010MIN
SURFACE ROUGHNESS = MICROINCHES RMS MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = MAX
THREADS = CLASS 2 MARK IN ACCORDANCE WITH TFT SPEC 5300-1055

8301B	
MODEL	NEXT ASSY
APPLICATION	

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
MATERIAL			
FINISH			
DR. BY KE		5/2/06	
CK. BY		5/4/06	
ENGR			
MFG.			
Q.A.			

TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584

BLOCK DIAGRAM
MODEL 8301B

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	D	6600-2377	A
SCALE —	DO NOT SCALE PRINT	SHEET 1 OF 1	

6601-3513 SH 1 REV A

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	ENGR. RELEASE			

IF BANDWIDTH SELECT — J3 — IF BW SWITCH S2 — +12V

5VP-P 850KHz 3RD IF FROM CASTING

U2 74221 — +5V — C15 56PF — R8 10K 1% — R9 4.7K — R10 1K — R11 1K

FILTER AMP MUX 1 — +12V — -12V — R43 2.2K

CR11 IN4001 — K1

Q8 2N2222 — Q10 2N4275 — Q11 2N4121 — R90 100 — R89 10K — R88 10K — R93 100 — R92 10K — R91 10K — C47 47 — R74 470 — R75 20K — R76 6.8K

TO AND FROM MODEL 7773 FOR HOT STANDBY SYSTEM

R81 68 — +12V

Q5 2N4121 — CR2 HP2800 — C18 100PF — R22 4.7K — R24 100 1% — R26 1.8K 1% — R25 100 1% — C19 100PF — CR3 HP2800 — R23 4.7K

Q4 2N4275 — Q3 2N4275 — TP1 — C16 3300 — C17 .1 — R19 2.2K — R18 2.2K — R20 1.5K — R21 1.5K

FL1 * LOW PASS FILTER 75 KHZ

C21 100 — R28 *6.2K — R27 2K* — R29 470 — R32 2K PHASE SHIFT COMPENS. — C27 1200 PF

U3 LF356 — C22 27PF — C23 .01 — C24 100 — TP5 — R30 3.6K — C28 4 — R35 820 — L5 470mH — C29 .22 — C30 270PF — C31 .003 — C32 .1 — R36 1.2K — R37 1K — C25 .01 — C26 100 — R33 4.7 — -12V

R38 20K — R39 47 — +12V — C33 27PF — U4 5534 — C34 4700uF 16V — R41 10K 10T PEGM LEVEL ADJUST — R40 2.2K — R42 2.2K — TP6

K1 — J7 — R77 51 — R78 51 — R79 51 — R80 51 — J5

MUX 1 .53V RMS — + PGM 1.24V RMS — MUX 2 155V RMS — - PGM 1.24V RMS

J4 — FROM XMFR — CR7 CR8 CR9 CR10 IN4001 — C36 4000 25V — C37 1000 25V — U12 LM340T — C38 .01 25V — C40 100 25V — +12V 115 mA — TP2 — U13 79/12 — C39 .01 25V — C41 100 25V — -12V 81 mA

J1 — +12V UNREG. — -12V REG. — +12V REG. — TO DISPLAY BD

J3 — SQUELCH — TO/FROM RCVR CASTING — SIGNAL STRENGTH

S2 RF GAIN SW — +12V REG. — U14 LM342-5 — C42 10 — C43 .1 — +5V

NO — NC — R99 2K 1/2 — C48 3300PF — -12V — R46 15.4K — U6 741 — R47 2.2K — R48 13K 1% — R49 2.21K 1% — R51 2.21K 1% — R50 13K 1% — +5V

S1 — +12V — -12V — +5V — PGM — MUX 1 — MUX 2

FILTER AMP MUX 2 — +12V — -12V — R83 2.2K — TP7

U9 318 — CR4 HP2800 — R62 1K — R63 1K — R61 1K — METER ADJUST — C44 .22 — R64 1M — U10 308 — C45 27PF — C46 3.3 — R65 5.6K — R66 10K

R84 1K — C20 1 — R86 1.5MEG — CR12 IN3064 — R85 1K — R59 5.23K 1% — R60 178K 1% — R2 100 — CR13 IN3064

(PGM) B — R52 2.2K — U7 356 — R54 10K PEGM METER ADJUST — R53 4.12K 1% — R55 13.3K 1% — (MUX1)C — R56 10K — U8 356 — R58 10K 1% — R57 10K 1% — (MUX 2) D

R68 10K — R67 4.7K — R69 1K — R94 MUTE 10K ADJUST — R82 1K — U11 741 — A71 2.2K — C49 1000pF — E

Q12 2N2222 — A98 1K — +12V — R72 100 — Q7 2N2222 — CR6 IN3064

J8 — J5 — LEFT CH + — LEFT CH — — RIGHT CH + — RIGHT CH — — CARRIER FAIL SW (NORMALLY CLOSED) — SIGNAL STRENGTH

J9 — TO METER

* 9. CHANGE FL1 TO 1052-0021, A27 TO 1061-3001 AND A28 TO 1061-6041 FOR OPTION 16, 7100-3790 (92 KHz)

8. ⬭ = AC VOLTAGE TYPICAL VOLTAGES FOR 1mV RF INPUT.
7. ▭ = DC VOLTAGE
6. ALL DC MEASUREMENTS MADE WITH NO RF INPUT.
5. REF; PCB ASSY 6608-3513
   PCB0 1600-3513

4. OPTION: C28 IS FOR 75 usec DE-EMPHASIS ONLY .022uf/100V
3. INDUCTOR VALUES ARE IN MICROHENRIES
2. CAPACITOR VALUES ARE IN MICROFARADS
1. RESISTOR VALUES ARE IN OHMS, 1/4W, 5%

NOTES: UNLESS OTHERWISE SPECIFIED

10 K1 RELAY IS SHOWN IN ENERGIZED POSITION

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
			MATERIAL
			FINISH

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ±
DECIMAL = 2 PLACE ± 3 PLACE ±
BREAK = .010MIN
SURFACE ROUGHNESS = MICROINCHES RMS: MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = MAX
THREADS = CLASS 2 MADE IN ACCORDANCE WITH TFT SPEC 5300-1058

MODEL	NEXT ASSY
8301B	6608-3513

APPLICATION

TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584

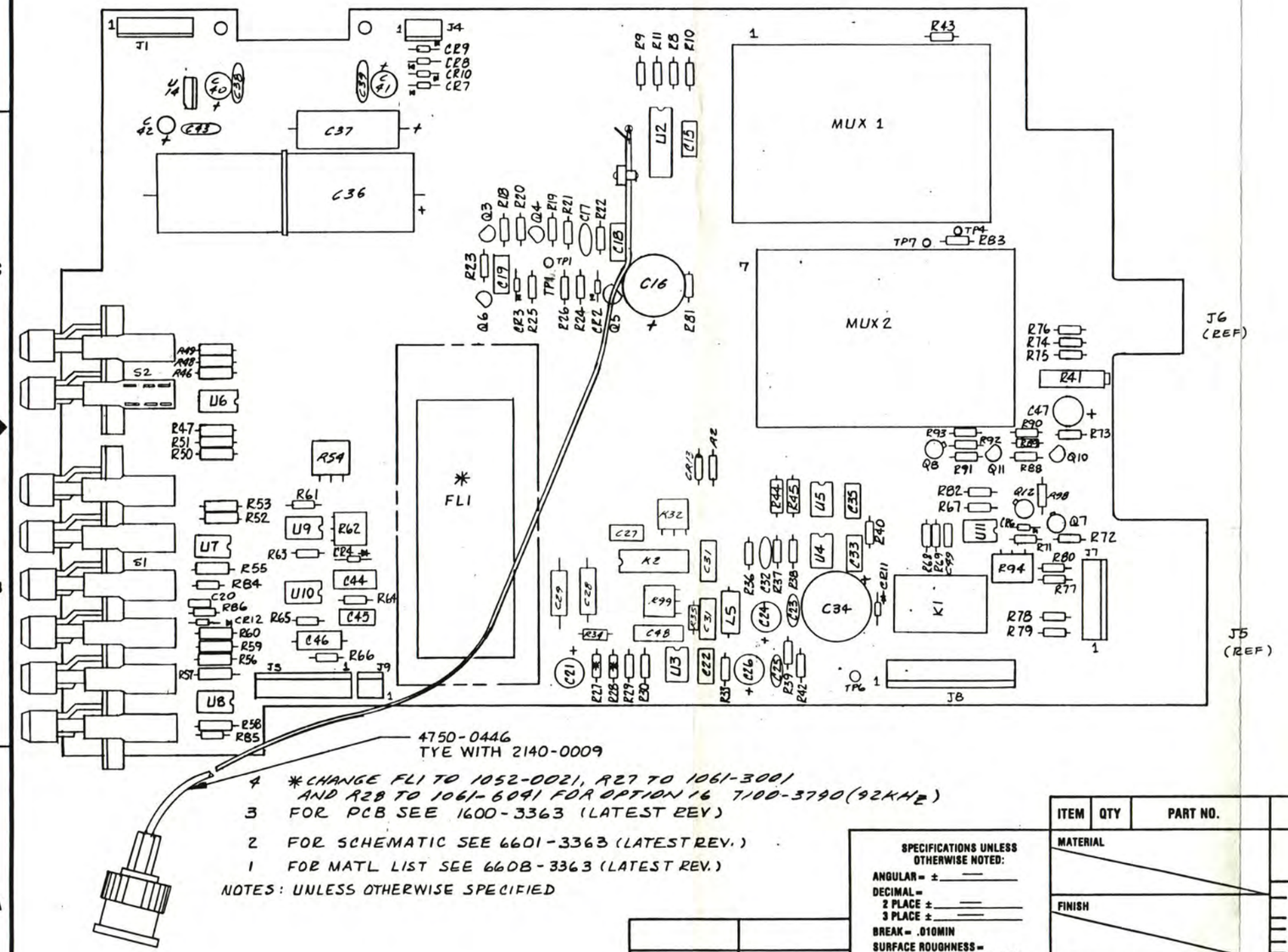
SCHEMATIC- RECEIVER MAIN BD 8301B

DR. BY	KK	4/21/86
CK. BY.		
ENGR.		
MFG.		
Q.A.		

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	D	6601-3513	A

SCALE — DO NOT SCALE PRINT SHEET 1 OF 1

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	PILOT RELEASE		4-25-86	



4750-0446
TYE WITH 2140-0009

4 * CHANGE FL1 TO 1052-0021, R27 TO 1061-3001 AND R28 TO 1061-6041 FOR OPTION 16 7100-3790(92KHz)
3 FOR PCB SEE 1600-3363 (LATEST REV)
2 FOR SCHEMATIC SEE 6601-3363 (LATEST REV.)
1 FOR MATL LIST SEE 6608-3363 (LATEST REV.)
NOTES: UNLESS OTHERWISE SPECIFIED

8301B	5102-3447
MODEL	NEXT ASSY
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ± ___
DECIMAL =
2 PLACE ± ___
3 PLACE ± ___
BREAK = .010MIN
SURFACE ROUGHNESS = ___ MICROINCHES RMS: MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = ___ MAX
THREADS = CLASS 2
MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
MATERIAL			
FINISH			
DR. BY KK		4-28-86	
CK. BY.			
ENGR			
MFG.			
Q.A.			

TFT INC
3090 OAKMEAD VILLAGE DR.
SANTA CLARA, CA. 95051
(408) 727-7272 TWX 910-338-0584

PCB ASSEMBLY- RECEIVER MAIN BOARD

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	C	6608-3513	A
SCALE FULL	DO NOT SCALE PRINT	SHEET 1 OF 1	

Model 8301B — STL RECEIVER - MAIN BOARD — Assembly #6608-3513 Rev A

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
R1	NOT USED		
R2	Resistor Car. Comp. 1/4W 100 5%	10	1065-0100
R3	NOT USED		
R4	NOT USED		
R5	NOT USED		
R6	NOT USED		
R7	NOT USED		
R8	Resistor Mt. Film 1/8W 10K 1%	2	1061-1002
R9	Resistor Car. Comp. 1/4W 4.7K 5%	5	1065-4701
R10	Resistor Car. Comp. 1/4W 1K 5%	10	1065-1001
R11	Resistor Car. Comp. 1/4W 1K 5%		1065-1001
R12	NOT USED		
R13	NOT USED		
R14	NOT USED		
R15	NOT USED		
R16	NOT USED		
R17	NOT USED		
R18	Resistor Car. Comp. 1/4W 2.2K 5%	6	1065-2201
R19	Resistor Car. Comp. 1/4W 2.2K 5%		1065-2201
R20	Resistor Car. Comp. 1/4W 1.5K 5%	2	1065-1501
R21	Resistor Car. Comp. 1/4W 1.5K 5%		1065-1501
R22	Resistor Car. Comp. 1/4W 4.7K 5%		1065-4701
R23	Resistor Car. Comp. 1/4W 4.7K 5%		1065-4701
R24	Resistor Car. Comp. 1/8W 100 1%	2	1061-0100
R25	Resistor Car. Comp. 1/8W 100 1%		1061-0100
R26	Resistor Car. Comp. 1/8W 1.8K 1%	1	1061-1801
R27	Resistor Car. Comp. 1/4W 2K 5%	1	1065-2001
R28	Resistor Car. Comp. 1/4W 6.2K 5%	1	1065-6201
R29	Resistor Car. Comp. 1/4W 470 5%	2	1065-0470
R30	Resistor Car. Comp. 1/4W 3.6K 5%	1	1065-3601
R31	NOT USED		
R32	Resistor Variable 1T 2K	2	1072-2001
R33	Resistor Car. Comp. 1/4W 47 5%	2	1065-0047
R34	Resistor Car. Comp. 1/4W 68K 5%	1	1065-6802
R35	Resistor Car. Comp. 1/4W 820 5%		1065-0820
R36	Resistor Car. Comp. 1/4W 1.2K 5%	1	1065-1201
R37	Resistor Car. Comp. 1/4W 1K 5%		1065-1001
R38	Resistor Car. Comp. 1/4W 20K 5%	2	1065-2002
R39	Resistor Car. Comp. 1/4W 47 5%		1065-0047
R40	Resistor Car. Comp. 1/4W 2.2K 5%		1065-2201
R41	Resistor Variable 10T 10K	1	1069-1002
R42	Resistor Car. Comp. 1/4W 2.2K 5%		1065-2201
R43	Resistor Car. Comp. 1/4W 2.2K 5%		1065-2201
R44	Resistor Car. Comp. 1/4W 10K 5%		1065-1002
R45	Resistor Car. Comp. 1/4W 10K 5%		1065-1002
R46	Resistor Car. Comp. 1/8W 15.4K 1%	1	1061-1542
R47	Resistor Car. Comp. 1/8W 2.21K 1%	3	1061-2221
R48	Resistor Car. Comp. 1/8W 13K 1%	2	1061-1302
R49	Resistor Car. Comp. 1/8W 2.21K 1%		1061-2221
R50	Resistor Car. Comp. 1/8W 13K 1%		1061-1302
R51	Resistor Car. Comp. 1/8W 2.21K 1%		1061-2221
R52	Resistor Car. Comp. 1/4W 2.2K 5%		1065-2201
R53	Resistor Car. Comp. 1/8W 4.12K 1%	1	1061-4101

Model 8301B — STL RECEIVER - MAIN BOARD — Assembly #6608-3513 Rev A

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
R54	Resistor Variable 1T 10K	2	1072-1002
R55	Resistor Mt. Film 1/8W 13.3K 1%	1	1061-1332
R56	Resistor Car. Comp. 1/4W 10K 5%		1065-1002
R57	Resistor Mt. Film 1/8W 10K 1%	1	1061-1002
R58	Resistor Mt. Film 1/8W 10K 1%		1061-1002
R59	Resistor Mt. Film 1/8W 5.23K 1%	1	1061-5231
R60	Resistor Mt. Film 1/8W 1.78K 1%	1	1061-1781
R61	Resistor Car. Comp 1/4W 1K 5%		1065-1001
R62	Resistor Variable 1T 2K	2	1072-2001
R63	Resistor Car. Comp. 1/4W 1K 5%		1065-1001
R64	Resistor Car. Comp. 1/4W 1M 5%	1	1065-1004
R65	Resostor Car. Comp. 1/4W 5.6K 5%	2	1065-5601
R66	Resistor Car. Comp. 1/4W 10K 5%		1065-1002
R67	Resistor Car. Comp. 1/4W 4.7K 5%		1065-4701
R68	Resistor Car. Comp. 1/4W 10K 5%		1065-1002
R69	Resistor Car. Comp. 1/4W 1K 5%		1065-1001
R70	NOT USED		
R71	Resistor Car. Comp. 1/4W 2.2K 5%	1	1065-2201
R72	Resistor Car. Comp. 1/4W 100 5%	3	1065-0100
R73	Resistor Car. Comp. 1/4W 5.6K 5%		1065-5601
R74	Resistor Car. Comp. 1/4W 470 5%		1065-0470
R75	Resistor Car. Comp. 1/4W 20K 5%		1065-2002
R76	Resistor Car. Comp. 1/4W 6.8K 5%	1	1065-6801
R77	Resistor Car. Comp. 1/4W 51 5%	4	1065-0051
R78	Resistor Car. Comp. 1/4W 51 5%		1065-0051
R79	Resistor Car. Comp. 1/4W 51 5%		1065-0051
R80	Resistor Car. Comp. 1/4W 51 5%		1065-0051
R81	Resistor Car. Comp. 1/4W 68 5%	1	1065-0068
R82	Resistor Car. Comp. 1/4W 1K 5%		1065-1001
R83	Resistor Car. Comp. 1/4W 2.2K 5%		1065-2201
R84	Resistor Car. Comp. 1/4W 1K 5%		1065-1001
R85	Resistor Car. Comp. 1/4W 1K 5%		1065-1001
R86	Resistor Car. Comp. 1/4W 1.5M 5%	1	1065-1504
R87	Not Used		
R88	Resistor Car. Comp. 1/4W 10K 5%		1065-1002
R89	Resistor Car. Comp. 1/4W 10K 5%		1065-1002
R90	Resistor Car. Comp. 1/4W 100 5%		1065-0100
R91	Resistor Car. Comp. 1/4W 10K 5%		1065-1002
R92	Resistor Car. Comp. 1/4W 10K 5%		1065-1002
R93	Resistor Car. Comp. 1/4W 100 5%		1065-0100
R94	Resistor Variable 1T 10K		1072-1002
R95	NOT USED		
R96	NOT USED		
R97	Resistor Car. Comp. 1/4W 4.7K 5%	1	1065-4701
R98	Resistor Car. Comp. 1/4W 1K 5%	1	1065-1001
R99	Resistor Variable 1T 2K		1072-2001
C1	NOT USED		
C2	NOT USED		
C3	NOT USED		
C4	NOT USED		
C5	NOT USED		
C6	NOT USED		
C7	NOT USED		

Model 8301B — STL RECEIVER - MAIN BOARD — Assembly #6608-3513 Rev A

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
	I.C. Socket 8 Pin	9	2250-1008
	I.C. Socket 14 Pin	1	2250-1014
	I.C. Socket 16 Pin	1	2250-1016
	Connector Jack 025 Pin	12	2250-3703
	Socket Relay	1	2250-0005
	Switch Assy. Two Station DPDT	1	1850-0025
	Switch Assy. Six Station DPDT	1	1850-0026
	PCB	1	1600-3363
	Cable Coax RG-188 3.5 inches	1	4750-9150
	Cable Assy Main Bd to Casting	1	4750-0446
	Retainer Relay	1	2140-0025

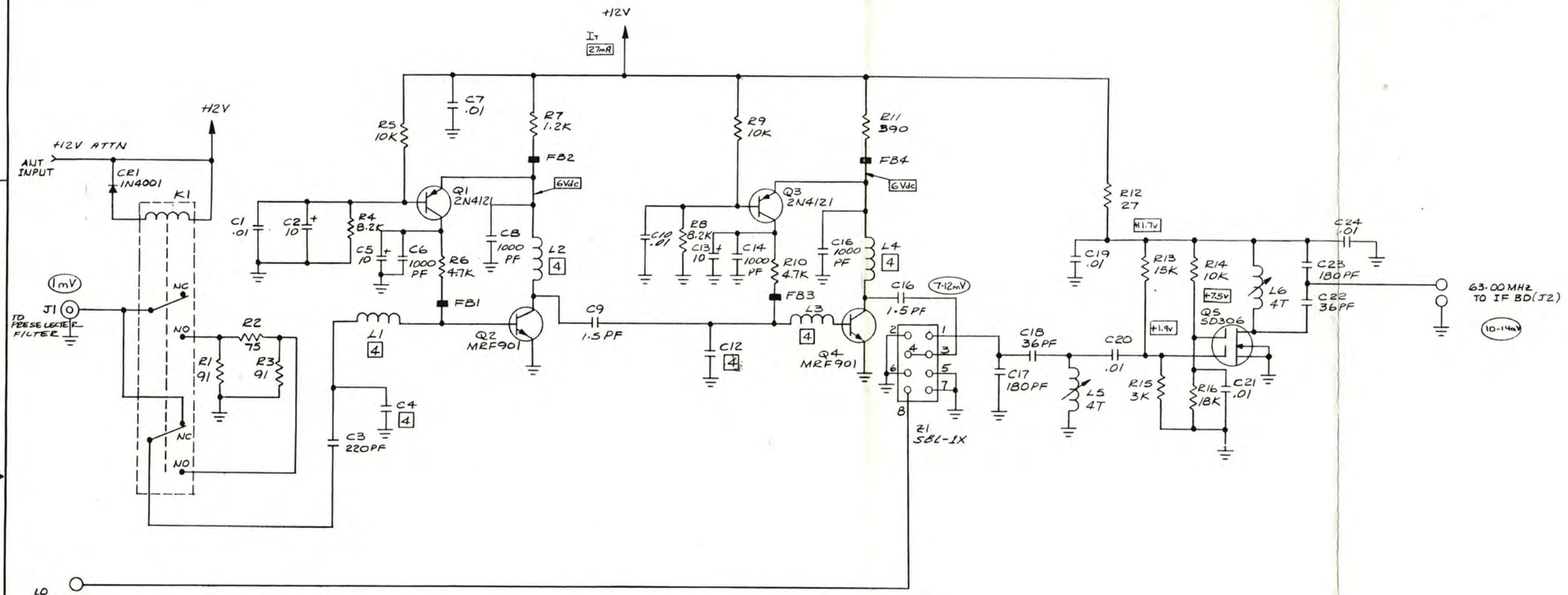
Model 8301B — STL RECEIVER - MAIN BOARD — Assembly #6608-3513 Rev A

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
C8	NOT USED		
C9	NOT USED		
C10	NOT USED		
C11	NOT USED		
C12	NOT USED		
C13	NOT USED		
C14	NOT USED		
C15	Cap. Mica 56pf	1	1001-0560
C16	Cap. Elect. 25V 3300ufd	1	1010-3301
C17	Cap. Ceramic Disc .1ufd	3	1005-0100
C18	Cap. Mica 100pf	2	1001-0101
C19	Cap. Mica 100pf		1001-0101
C20	Cap. Ceramic Disc 1ufd	1	1005-0001
C21	Cap. Elect. Vert. Mt. 16V 100ufd	5	1010-0110
C22	Cap. Mica 27pf	3	1001-0270
C23	Cap. Ceramic Disc .01ufd	4	1005-1039
C24	Cap. Elect. Vert. Mt. 16V 100ufd		1010-0110
C25	Cap. Ceramic Disc .01ufd		1005-1039
C26	Cap. Elect. 16V 100ufd		1010-0110
C27	Cap. Mica 1200pF	1	1001-0122
C28*	NOT USED		
C29	Cap. Mylar .22ufd	2	1007-0220
C30	Cap. Mica 270pf	1	1001-0271
C31	Cap. Poly Carb. .0013ufd	1	1006-0013
C32	Cap. Ceramic Disc .1ufd		1005-0100
C33	Cap. Mica 27pf		1001-0270
C34	Cap. Elect. 16V 4700ufd	1	1010-4701
C35	Cap. Mica 30pf	1	1001-0300
C36	Cap. Elect. 25V 4000ufd	1	1010-0402
C37	Cap. Elect. 25V 1000ufd	1	1010-1002
C38	Cap. Ceramic Disc 25V .01ufd		1005-1039
C39	Cap. Ceramic Disc 25V .01ufd		1005-1039
C40	Cap. Elect. Vert. Mt. 16V 100ufd		1010-0110
C41	Cap. Elect. Vert. Mt. 16V 100ufd		1010-0110
C42	Cap. Elect. Vert. Mt. 16V 10ufd	1	1010-0099
C43	Cap. Ceramic Disc .1ufd		1005-0100
C44	Cap. Mylar .22ufd	1	1007-0220
C45	Cap. MICA 27pf		1001-0270
C46	Cap. Tan. 35V 3.3ufd	1	1008-0033
C47	Cap. Elect. 25V 47ufd	1	1010-0048
C48	Cap Mica 3300pf	1	1001-0332
C49	CAPCERAMIC .001ufd CK05	1	1015-0010
L1	NOT USED		
L2	Inductor 390uH	1	1531-0391
L3	Inductor 33uH	1	1531-0330
L4	NOT USED		
L5	Inductor 470uH	1	1530-0471
CR1	NOT USED		
CR2	Diode Hot Carrier HP2800	3	1282-2300
CR3	Diode Hot Carrier HP2800		1282-2800
CR4	Diode Hot Carrier HP2800		1282-2800

Model 8301B — STL RECEIVER - MAIN BOARD — Assembly #6608-2513 Rev.A

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
CR5	NOT USED		
CR6	Diode IN3064	3	1281-3064
CR7	Diode Rectifier IN4001	5	1284-4001
CR8	Diode Rectifier IN4001		1284-4001
CR9	Diode Rectifier IN4001		1284-4001
CR10	Diode Rectifier IN4001		1284-4001
CR11	Diode Rectifier IN4001		1284-4001
CR12	Diode IN3064		1281-3064
CR13	Diode IN3064		1281-3064
Q1	Transistor 2N4121	3	1271-4121
Q2	Transistor 2N3563	1	1271-3563
Q3	Transistor 2N4275	4	1271-4275
Q4	Transistor 2N4275		1271-4275
Q5	Transistor 2N4121	2	1271-4121
Q6	Transistor 2N4275		1271-4275
Q7	Transistor 2N2222	3	1271-2222
Q8	Transistor 2N2222		1271-2222
Q9	NOT USED		
Q10	Transistor 2N4275		1271-4275
Q11	Transistor 2N4121		1271-4121
Q12	Transistor 2N2222		1271-2222
U1	I.C. LM710	1	1100-0710
U2	I.C. 74221	1	1100-7422
U3	I.C. LF356	3	1100-0356
U4	I.C. NE5534N	2	1100-5534
U5	I.C. NE5534N		1100-5534
U6	I.C LM741 CN	2	1100-0741
U7	I.C. LF356		1100-0356
U8	I.C. LF356		1100-0356
U9	I.C. LM318	1	1100-0318
U10	I.C. LM308	1	1100-0308
U11	I.C. LM741 CN		1100-0741
U12	I.C. LM340T-12	1	1100-0340
U13	I.C. MC7912	1	1100-7912
U14	I.C. LM342-5	1	1100-4205
J1	Connector Molex Plug 6 Pin	2	2250-6006
J3	Connector Molex Plug 8 Pin	1	2250-6008
J4	Connector Molex Plug 3 Pin	1	2250-6003
J7	Connector Molex Plug 6 Pin		2250-6006
J8	Connector Molex Plug 10 Pin	1	2250-6010
J9	Connector Molex Plug 2 Pin	1	2250-6002
FL1	Filter Assy	1	1052-0002
K1	Relay AZ 421-1011-10L	1	1880-0016
K2	Relay 12VDC 2A at 28VDC	1	1880-0022

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	PILOT RELEASE		2-16-83	
B	PROD. RELEASE		4-26-83	
C	REVISED PER ECO 1638	RE	4-18-84	



B. ⬭ = AC VOLTAGE TYPICAL VOLTAGES FOR 1mV RF INPUT

7. ▭ = DC VOLTAGE

6. ALL DC MEASUREMENTS MADE WITH NO RF INPUT.

5. REF; PCB ASSY 6608-3347
PC BD 1600-3347

[4] PRINTED MICRO STRIP COMPONENTS

3 INDUCTOR VALUES ARE IN MICROHENRIES

2 CAPACITOR VALUES ARE IN MICROFARADS

1. RESISTOR VALUES ARE IN OHMS 1/4W ± 5%

NOTES: UNLESS OTHERWISE SPECIFIED

8301	6608-3347
MODEL	NEXT ASSY
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ± ——
DECIMAL = 2 PLACE ± —— 3 PLACE ± ——
BREAK = .010 MIN
SURFACE ROUGHNESS = —— MICROINCHES RMS MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = —— MAX
THREADS = CLASS 2
MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION

MATERIAL
FINISH

DR. BY	Richie	2-16-83
CK. BY		
ENGR		5/20/83
MFG		5/20/83
Q.A.		7/19/83
	R Kramer	7/19/83

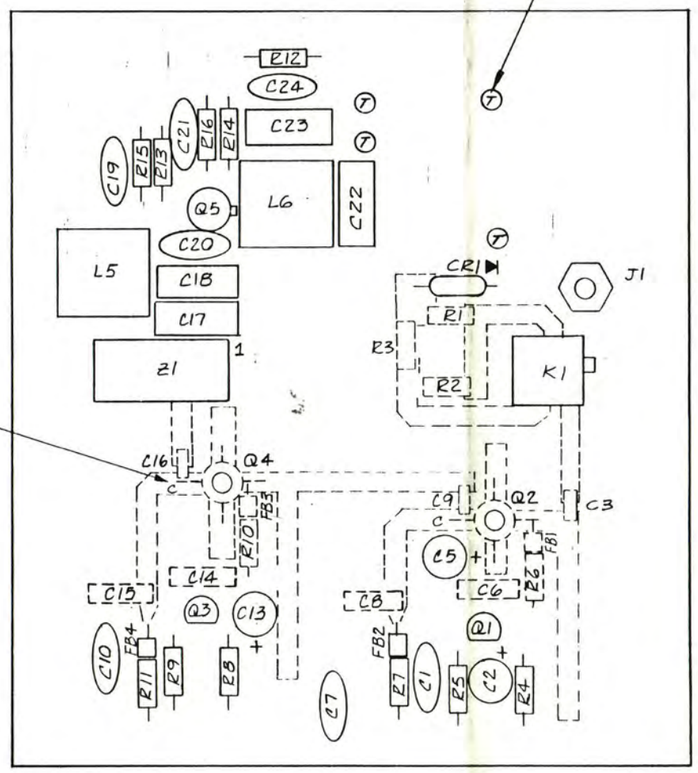
TFT INC
3090 OAKMEAD VILLAGE DR.
SANTA CLARA, CA. 95051
(408) 727-7272 TWX 910-338-0584

SCHEMATIC-
FRONT END BD

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	D	6601-3347	C

SCALE — DO NOT SCALE PRINT SHEET 1 OF 1

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	PILOT RELEASE	[illegible]	2-16-83	
B	PROD. RELEASE	[illegible]	3-17-83	
C	REVISED PER ECO 1638	KK	4-18-84	



3. FOR PC BOARD SEE 1600-3347 (LATEST REV.)
2. FOR SCHEMATIC SEE 6601-3347 (LATEST REV)
1. FOR MATL LIST SEE 6608-3347 (LATEST REV)

NOTES: UNLESS OTHERWISE SPECIFIED

B301	5102-3371
MODEL	NEXT ASSY
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ±___
DECIMAL = 2 PLACE ±___ 3 PLACE ±___
BREAK = .010MIN
SURFACE ROUGHNESS = ___MICROINCHES RMS: MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = ___MAX
THREADS = CLASS 2 MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
MATERIAL			
FINISH			

DR. BY	L. Ruchie	3-17-83
CK. BY.		
ENGR	[illegible]	5/20/83
MFG.	[illegible]	5/20/83
Q.A.	[illegible]	5/17/83
	K. Kiriacou	5/24/83

TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584

PC BOARD ASSEMBLY-FRONT END

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	C	6608-3347	C
SCALE 2/1	DO NOT SCALE PRINT	SHEET 1 OF 1	

Model 8301 Front End Bd. Assembly #6608-3347 Rev. C

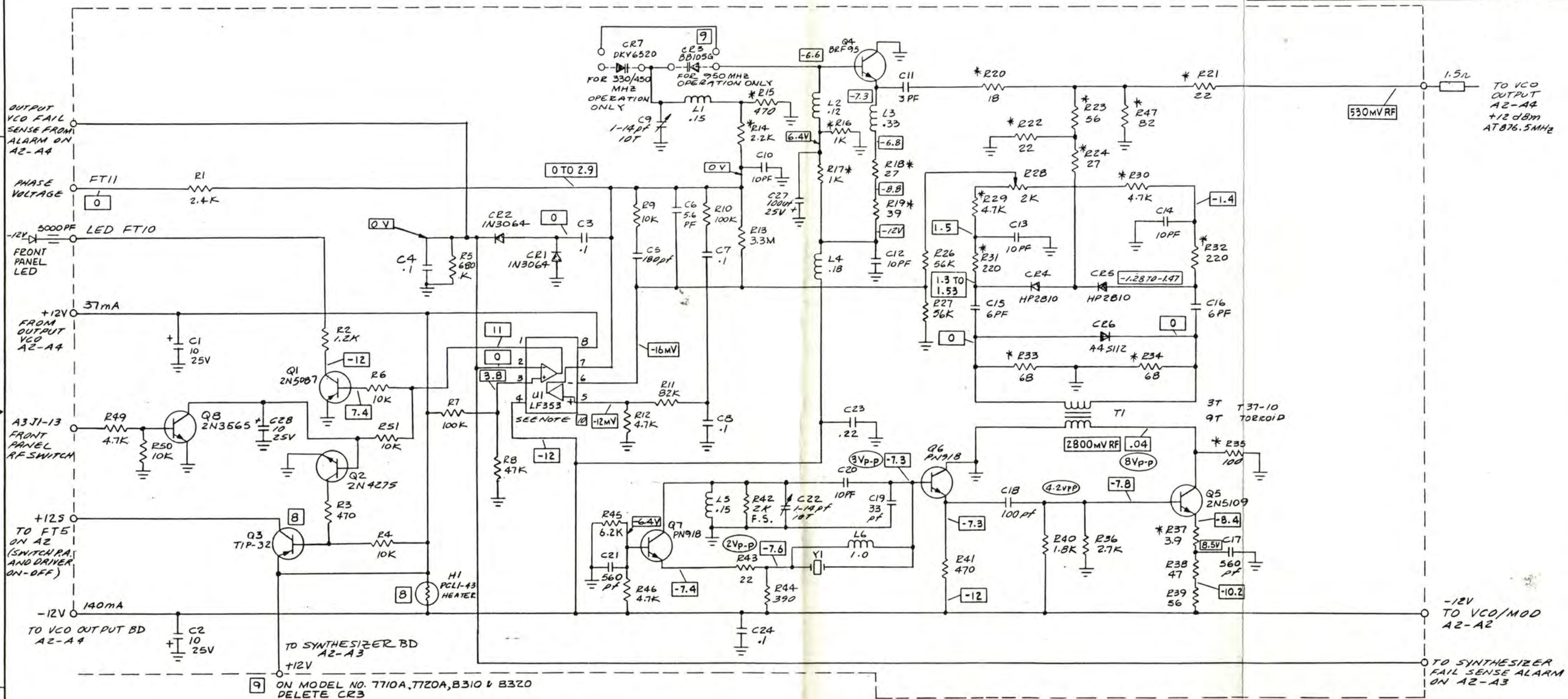
CKT REF	DESCRIPTION	QTY	TFT STOCK NO.
C1	Cap Cer Disc .01uF	7	1005-1039
C2	Cap Electrolytic 25v 10uF	4	1010-0099
C3	Cap Chip 220pF	1	1009-2200
C4	Printed Cap		
C5	Cap Electrolytic 25v 10uF		1010-0099
C6	Cap Chip 1000pF	4	1009-1002
C7	Cap Cer Disc .01uF		1005-1039
C8	Cap Chip 1000pF		1009-1002
C9	Cap Chip 1.5pF	2	1009-0015
C10	Cap Cer Disc .01uF		1005-1039
C11	Cap Elect 25v 10uF		1010-0099
C12	Printed Cap		
C13	Cap Elect 25v 10uF		1010-0099
C14	Cap Chip 1000pF		1009-1002
C15	Cap Chip 1000pF		1009-1002
C16	Cap Chip 1.5pF		1009-0015
C17	Cap Mica 180pF	2	1001-0181
C18	Cap Mica 36pF	2	1001-0360
C19	Cap Cer Disc .01uF		1005-1039
C20	Cap Cer Disc .01uF		1005-1039
C21	Cap Cer Disc .01uf		1005-1039
C22	Cap Mica 36pF		1001-0360
C23	Cap Mica 180pF		1001-0181
C24	Cap Cer Disc .01uF		1005-1039
CR1	Diode IN4001	1	1284-4001
R1	Resistor Car Comp 1/4w 5% 91	2	1065-0091
R2	Resistor Car Comp 1/4w 5% 75	1	1065-0075
R3	Resistor Car Comp 1/4w 5% 91		1065-0091
R4	Resistor Car Comp 1/4w 5% 8.2K	2	1065-8201
R5	Resistor Car Comp 1/4w 5% 10K	3	1065-1002
R6	Resistor Car Comp 1/4w 5% 4.7K	2	1065-4701
R7	Resistor Car Comp 1/4w 5% 1.2K	1	1065-1201
R8	Resistor Car Comp 1/4w 5% 8.2K		1065-8201
R9	Resistor Car Comp 1/4w 5% 10K		1065-1002
R10	Resistor Car Comp 1/4w 5% 4.7K		1065-4701
R11	Resistor Car Comp 1/4w 5% 390	1	1065-0390
R12	Resistor Car Comp 1/4w 5% 27	1	1065-0027
R13	Resistor Car Comp 1/4w 5% 15K	1	1065-1502
R14	Resistor Car Comp 1/4w 5% 10K		1065-1002
R15	Resistor Car Comp 1/4w 5% 3K	1	1065-3001
R16	Resistor Car Comp 1/4w 5% 18K	1	1065-1802

Model 8301 Front End Bd. Assembly #6608-3347 Rev. C

CKT REF	DESCRIPTION	QTY	TFT STOCK NO.
L1	Printed Inductor		
L2	Printed Inductor		
L3	Printed Inductor		
L4	Printed Inductor		
L5	Inductor UAR 4 Turn	2	1550-0010
L6	Inductor UAR 4 Turn		1550-0010
Q1	Transistor 2N4121	2	1271-4121
Q2	Transistor MRF901	2	1274-0901
Q3	Transistor 2N4121		1271-4121
Q4	Transistor MRF901		1274-0901
Q5	Transistor SD306	1	1100-6306
K1	Relay	1	1880-0016
	Ferrite Beads (as required)	4	1501-0654
Z1	Mixer SRA2CM	1	4500-0003
J1	Conn Sub min 50 Ohm	1	2200-0004
	PC Board	1	1600-3347
	Solid Pin Plug	4	2140-0071

REVISIONS

REV	DESCRIPTION	DR	DATE	APPD
A	PROD. RELEASE		5-13-83	
B	Q8, R49 R50 R51 ADDED		9-1-83	
C	REVISED PER ECO 1622	KK	4-6-84	
D	REVISED PER ECO 1658	KK	11-8-84	
E	INFORMATION UPDATE	KK	5-9-85	
F	ADD AC AND DC VOLTAGE CALLOUT		11-20-85	
G	R2 WAS 560 Ω, Q2 WAS 2N5089, R42 WAS 1.2K	KK	12-23-85	



9 ON MODEL NO. 7710A, 7720A, 8310 & 8320 DELETE CR3

8 NOT INSTALLED ON 8301 RECEIVER

* PARTS TO BE CARBON COMP ONLY

7. ( ) = AC VOLTAGE TYPICAL VOLTAGES PP
6. [ ] = DC VOLTAGE
5. ALL DC MEASUREMENTS MADE WITH NO RF INPUT.
4. REF; PCB ASSY 6608-3375
   PC BD 1600-3375
3. INDUCTOR VALUES ARE IN MICROHENRIES
2. CAPACITOR VALUES ARE IN MICROFARADS
1. RESISTOR VALUES ARE IN OHMS 1/4W 5%

NOTES: UNLESS OTHERWISE SPECIFIED

10 DO NOT USE SOCKET FOR U1

MODEL	NEXT ASSY
8300	6608-3375
8301	6608-3375

APPLICATION

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ± —
DECIMAL =
2 PLACE ± —
3 PLACE ± —
BREAK = .010MIN
SURFACE ROUGHNESS = — MICROINCHES RMS MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = — MAX
THREADS = CLASS 2
MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION

MATERIAL
FINISH
DR. BY 5-13-83
CK. BY.
ENGR. 9/20/83
MFG. 7/9/84
Q.A. 7/16/84

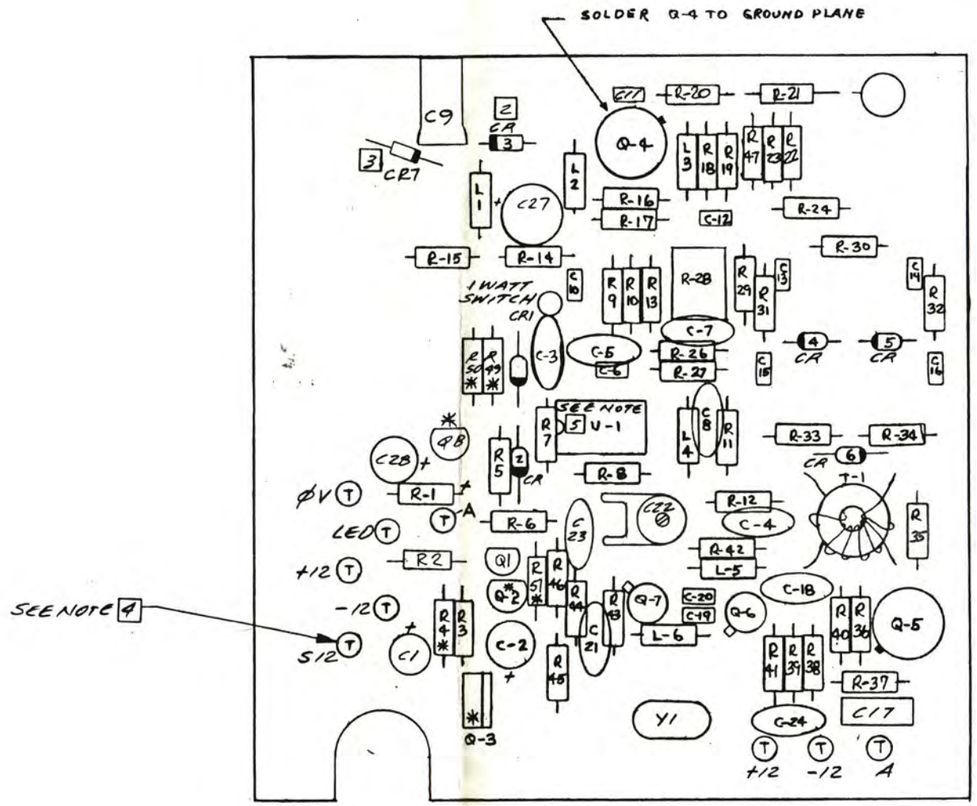
TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584

SCHEMATIC- LOCK UPCONVERTER L.O. A2-A1

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	D	6601-3375	G

SCALE — DO NOT SCALE PRINT SHEET 1 OF 1

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	PROD. RELEASE	5-12-83	
	B	GND PADS ADDED	6-27-83	
	C	QB, R49, R50 ADDED	9-1-83	
	D	REVISED PER ECO 1622	4-6-84	
	E	REVISED PER ECO 1658	10-23-84	
	F	REVISED PER ECO 1664	10-25-84	
	G	R2 WAS 560, R42 WAS 1.2K, Q2 WAS 2N5089	12-23-85	



REF; SCHEMATIC 6601-3375
PCB 1600-3375
FOR MATL LIST SEE 6608-3375

5 DO NOT INSTALL SOCKET FOR U1

4 INDICATES AMP PIN

3 DELETE CR7 ON MODEL 8300, 8301

2 DELETE CR3 ON MODEL 7710A, 7720A, 8310, 8320

1. * NOT TO BE USED IN MODEL 8301

NOTE: UNLESS OTHERWISE SPECIFIED

5102-3385	8300
5102-3371	8301
NEXT ASSY	USED ON
APPLICATION	

QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION
PARTS LIST				

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN DR2	1-12-83
CHECKED	5/20/83
ISSUED	5/20/83
	6/22/83
K. Ramirez	6/24/83

TIME & FREQUENCY TECHNOLOGY INC.

PCB ASSEMBLY-
LOCK UPCONVERTER L.O.

SIZE	FSCM NO.	DWG. NO.	REV.
C		6608-3375	G

SCALE 2/1 SHEET 1 OF 1

DWG. NO. 6608-3375 SH 1 REV.

Model 8300 — LOCK UPCONVERTER L.O. — Assembly #6608-3375 REV. G

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
R1	RESISTOR CAR COMP. 1/4W 5% 2.4K	1	1065-2401
R2	RESISTOR CAR COMP. 1/4W 5% 560	1	1065-0560
R3	RESISTOR CAR COMP. 1/4W 5% 470	1	1065-0470
R4*	RESISTOR CAR COMP. 1/4W 5% 10K	5	1065-1002
R5	RESISTOR CAR COMP. 1/4W 5% 620K	1	1065-6203
R6	RESISTOR CAR COMP. 1/4W 5% 10K		1065-1002
R7	RESISTOR CAR COMP. 1/4W 5% 100K	2	1065-1003
R8	RESISTOR CAR COMP. 1/4W 5% 47K	1	1065-4702
R9	RESISTOR CAR COMP. 1/4W 5% 10K		1065-1002
R10	RESISTOR CAR COMP. 1/4W 5% 100K		1065-1003
R11	RESISTOR CAR COMP. 1/4W 5% 82K	1	1065-8202
R12	RESISTOR CAR COMP. 1/4W 5% 4.7K	4	1065-4701
R13	RESISTOR CAR COMP. 1/4W 5% 3.3MEG	1	1065-3304
R14	RESISTOR CAR COMP. 1/4W 5% 2.2K HI REL	1	1062-2201
R15	RESISTOR CAR COMP. 1/4W 5% 470 HI REL	1	1062-0470
R16	RESISTOR CAR COMP. 1/4W 5% 1K HI REL	2	1062-1001
R17	RESISTOR CAR COMP. 1/4W 5% 1K HI REL		1062-1001
R18	RESISTOR CAR COMP. 1/4W 5% 27 HI REL	2	1062-0027
R19	RESISTOR CAR COMP. 1/4W 5% 39 HI REL	1	1062-0039
R20	RESISTOR CAR COMP. 1/4W 5% 18 HI REL	1	1062-0018
R21	RESISTOR CAR COMP. 1/4W 5% 22 HI REL	2	1062-0022
R22	RESISTOR CAR COMP. 1/4W 5% 22 HI REL		1062-0022
R23	RESISTOR CAR COMP. 1/4W 5% 56 HI REL	1	1062-0056
R24	RESISTOR CAR COMP. 1/4W 5% 27 HI REL	1	1062-0027
R25	NOT USED		
R26	RESISTOR CAR COMP. 1/4W 5% 56K	2	1065-5602
R27	RESISTOR CAR COMP. 1/4W 5% 56K		1065-5602
R28	RESISTOR VARIABLE 20T 2K	1	1072-2000
R29	RESISTOR CAR COMP. 1/4W 5% 4.7K HI REL	2	1062-4701
R30	RESISTOR CAR COMP. 1/4W 5% 4.7K HI REL		1062-4701
R31	RESISTOR CAR COMP. 1/4W 5% 220 HI REL	2	1062-0220
R32	RESISTOR CAR COMP. 1/4W 5% 220 HI REL		1062-0220
R33	RESISTOR CAR COMP. 1/4W 5% 68 HI REL	2	1062-0068
R34	RESISTOR CAR COMP. 1/4W 5% 68 HI REL		1062-0068
R35	RESISTOR CAR COMP. 1/4W 5% 100 HI REL	1	1062-0100
R36	RESISTOR CAR COMP. 1/4W 5% 2.7K HI REL	1	1062-2701
R37	RESISTOR CAR COMP. 1/4W 5% 3.9 HI REL	1	1062-0003
R38	RESISTOR CAR COMP. 1/4W 5% 47	1	1065-0047
R39	RESISTOR CAR COMP. 1/4W 5% 56	1	1065-0056
R40	RESISTOR CAR COMP. 1/4W 5% 1.8K HI REL	1	1062-1801
R41	RESISTOR CAR COMP. 1/4W 5% 470 HI REL	1	1062-0470
R42	RESISTOR CAR COMP. 1/4W 5% 1.2K	1	1065-1201
R43	RESISTOR CAR COMP. 1/4W 5% 22	1	1065-0022
R44	RESISTOR CAR COMP. 1/4W 5% 390	1	1065-0390
R45	RESISTOR CAR COMP. 1/4W 5% 4.7K		1065-4701
R46	RESISTOR CAR COMP. 1/4W 5% 4.7K		1065-4701
R47	RESISTOR CAR COMP. 1/4W 5% 82 HI REL	1	1062-0082
R48	NOT USED		
R49*	RESISTOR CAR COMP. 1/4W 5% 4.7K		1065-4701
R50*	RESISTOR CAR COMP. 1/4W 5% 10K		1065-1002
R51*	RESISTOR CAR COMP 1/4W 5% 10K		1065-1002

Model 8300 — LOCK UPCONVERTER L.O. — Assembly #6608-3375 REV. G

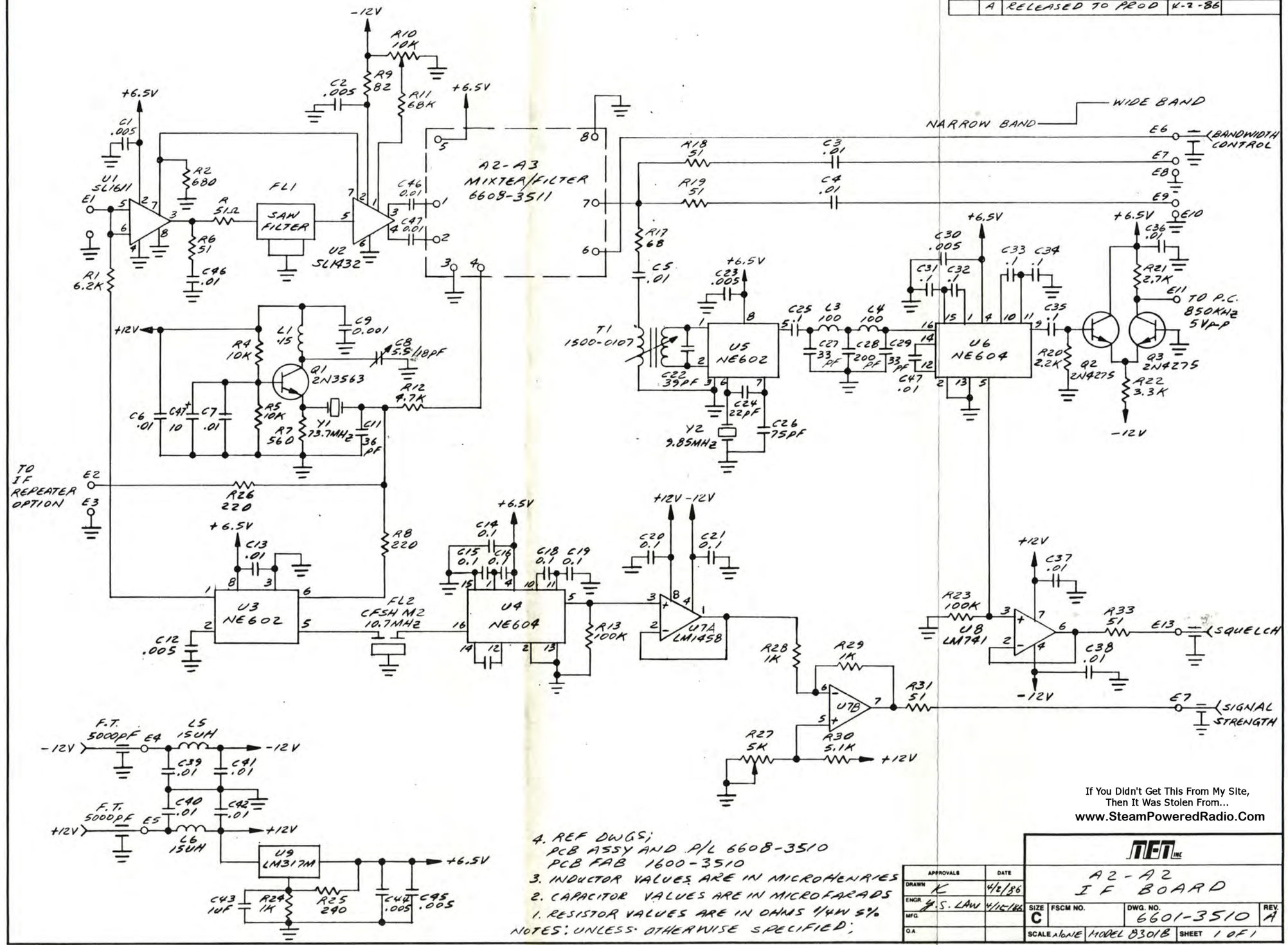
CKT REF	DESCRIPTION	QTY	TFT STOCK NO
C1	CAP ELECT 25V 10UFD	3	1010-0099
C2	CAP ELECT. 25V 10UFD		1010-0099
C3	CAP MONO .1UFD	5	1016-0010
C4	CAP MONO .1UFD		1016-0010
C5	CAP MICA 180PF	1	1001-0181
C6	CAP MINI CERAMIC NPO 100V 5.6PF	3	1005-0055
C7	CAP MONO .1UFD		1016-0010
C8	CAP MONO .1UFD		1016-0010
C9	CAP VARIABLE 1-14PF	1	1012-0020
C10	CAP MINI CERAMIC NPO 63V 10PF	5	1005-0011
C11	CAP MINI CERAMIC NPO 100V 3.3PF	1	1005-0032
C12	CAP MINI CERAMIC NPO 63V 10PF		1005-0011
C13	CAP MINI CERAMIC NPO 63V 10PF		1005-0011
C14	CAP MINI CERAMIC NPO 63V 10PF		1005-0011
C15	CAP MINI CERAMIC NPO 100V 5.6PF		1005-0055
C16	CAP MINI CERAMIC NPO 100V 5.6PF		1005-0055
C17	CAP CKO5BX 560PF	2	1015-0560
C18	CAP CERAMIC 100PF	1	1015-0100
C19	CAP MINI CERAMIC NPO 63V 33PF	1	1005-0012
C20	CAP MINI CERAMIC NPO 63V 10PF		1005-0011
C21	CAP CKO5BX 560PF		1015-0560
C22	CAP VARIABLE 1-14PF	1	1012-0814
C23	CAP CER .22MF CKO6BX K	1	1015-0003
C24	CAP MONO .1UFD		1016-0010
C25	NOT USED		
C26	CAP CHIP 3PF 7700	1	1009-0030
C27	CAP ELECT 25V 100UFD	1	1010-0110
C28	CAP ELECT 25V 100UFD		1010-0099
L1	CHOKE RF .15UHY	2	1531-0015
L2	CHOKE PF .12UHY	1	1531-0012
L3	CHOKE RF .33UHY	1	1531-0033
L4	CHOKE RF .18UHY	1	1531-0018
L5	CHOKE RF .15UHY		1531-0015
L6	CHOKE RF 1UHY	1	1530-0010
CR1	DIODE 1N3064	2	1281-3064
CR2	DIODE 1N3064		1281-3064
CR3	VARICAP BB105G 2-16PF	1	1290-0105
CR4	DIODE HP2810	2	1283-2810
CR5	DIODE HP2810		1283-2810
CR6	DIODE A4S112	1	1282-0112
CR7	NOT USED		
CR8	NOT USED		
T1	TRANSFORMER	1	1501-0008

Model 8300 — LOCK UPCONVERTER L.O. — Assembly #6608-3375 REV. G

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
Q1	TRANSISTOR 2N5087	1	1271-5087
Q2*	TRANSISTOR 2N5089	1	1271-5089
Q3*	TRANSISTOR HP-32	1	1272-0525
Q4	TRANSISTOR BFR95	1	1271-0095
Q5	TRANSISTOR 2N5109	1	1271-5109
Q6	TRANSISTOR PN918	2	1271-0918
Q7	TRANSISTOR PN918		1271-0918
Q8*	TRANSISTOR 2N3565	1	1271-3565
U1	I.C. LF353	1	1100-0353
Y1	XTAL 87.65MHZ	1	2400-8765
	I.C. SOCKET 8 PIN	1	2250-1008
H1*	CRYSTAL HEATER PCL1-43	1	2450-0004
	PCB	1	1600-3375
	SOLID PIN PLUG	9	2140-0071

* R4, R49, R50, R51, Q2, Q3, Q8, AND H1 ARE NOT USED ON MODEL 8301.

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	RELEASED TO PROD	4-2-86	



4. REF DWGS;
   PCB ASSY AND P/L 6608-3510
   PCB FAB 1600-3510
3. INDUCTOR VALUES ARE IN MICROHENRIES
2. CAPACITOR VALUES ARE IN MICROFARADS
1. RESISTOR VALUES ARE IN OHMS 1/4W 5%

NOTES: UNLESS OTHERWISE SPECIFIED;

APPROVALS	DATE
DRAWN K	4/2/86
ENGR J.S. LAW	4/16/86
MFG.	
Q.A	

NEN INC

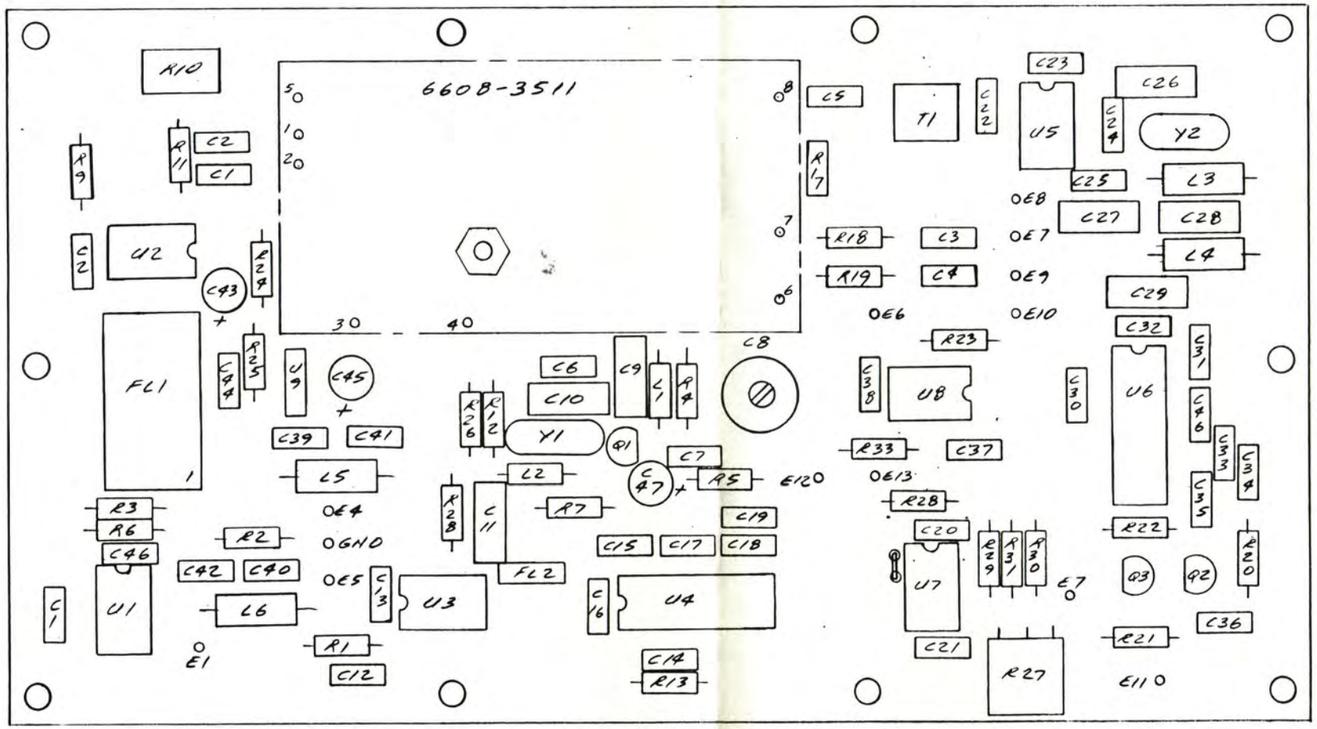
A2-A2
I F BOARD

SIZE	FSCM NO.	DWG. NO.	REV.
C		6601-3510	A

SCALE NONE | MODEL 8301B | SHEET 1 OF 1

BISHOP GRAPHICS/ACCUPRESS
REORDER NO. A30622

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	RELEASED TO PROD	K		4-10-90



B301B	5102-3448
MODEL	NEXT ASSY
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ±_____
DECIMAL =
2 PLACE ±_____
3 PLACE ±_____
BREAK = .010MIN
SURFACE ROUGHNESS = _____MICROINCHES RMS: MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = _____MAX
THREADS = CLASS 2 MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
			MATERIAL
			FINISH

DR. BY. K	4/10/90	
CK. BY.		
ENGR. G.S.LAW	4/15/86	
MFG.		
Q.A.		

TFT INC
3090 OAKMEAD VILLAGE DR.
SANTA CLARA, CA. 95051
(408) 727-7272 TWX 910-338-0584

PCB ASSY
IF FILTER

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	C	6608-3510	A

SCALE 1/1 | DO NOT SCALE PRINT | SHEET 1 OF 1

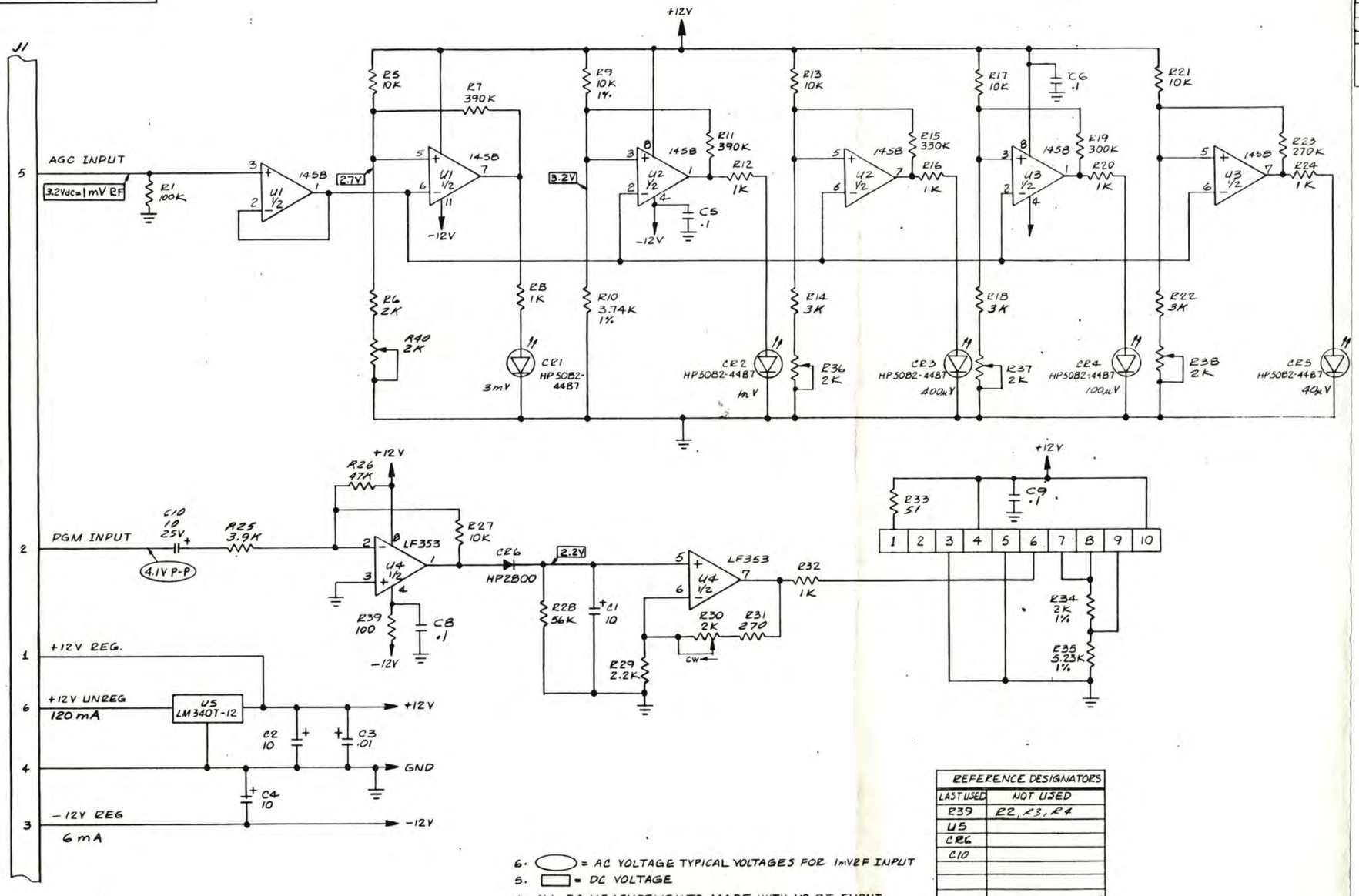
CKT REF	DESCRIPTION	QTY	TFT STOCK NO.
C01	CAP CER DISC .005MFD	1	1005-5049
C02	CAP CER DISC .005MFD	1	1005-5049
C03	CAP CER .01MF CK05BX K	1	1015-0002
C04	CAP CER .01MF CK05BX K	1	1015-0002
C05	CAP CER .01MF CK05BX K	1	1015-0002
C06	CAP CER .01MF CK05BX K	1	1015-0002
C07	CAP CER .01MF CK05BX K	1	1015-0002
C08	CAP VAR 5.5-18PF 3315 3323	1	1012-0519
C09	CAP MICA 10 PF	1	1001-0100
C10	CAP MICA 10 PF	1	1001-0100
C11	CAP MICA 24 PF	1	1001-0240
C12	CAP CER DISC .005MFD	1	1005-5049
C13	CAP CER .01MF CK05BX K	1	1015-0002
C14	CAP CER 0.1MF CK05BX K	1	1015-0001
C15	CAP CER 0.1MF CK05BX K	1	1015-0001
C16	CAP CER 0.1MF CK05BX K	1	1015-0001
C17	CAP CER .01MF CK05BX K	1	1015-0002
C18	CAP CER 0.1MF CK05BX K	1	1015-0001
C19	CAP CER 0.1MF CK05BX K	1	1015-0001
C20	CAP CER 0.1MF CK05BX K	1	1015-0001
C21	CAP CER 0.1MF CK05BX K	1	1015-0001
C22	CAP MINI CER 39PF NPO RECT	1	1017-0390
C23	CAP CER DISC .005MFD	1	1005-5049
C24	CAP MONO CER 22 PF	1	1016-0922
C25	CAP CER 0.1MF CK05BX K	1	1015-0001
C26	CAP MICA 75 PF	1	1001-0750
C27	CAP MICA 33 PF	1	1001-0330
C28	CAP MICA 200 PF	1	1001-0201
C29	CAP MICA 33 PF	1	1001-0330
C30	CAP CER DISC .005MFD	1	1005-5049
C31	CAP CER 0.1MF CK05BX K	1	1015-0001
C32	CAP CER 0.1MF CK05BX K	1	1015-0001
C33	CAP CER 0.1MF CK05BX K	1	1015-0001
C34	CAP CER 0.1MF CK05BX K	1	1015-0001
C35	CAP CER 0.1MF CK05BX K	1	1015-0001
C36	CAP CER .01MF CK05BX K	1	1015-0002
C37	CAP CER .01MF CK05BX K	1	1015-0002
C38	CAP CER .01MF CK05BX K	1	1015-0002
C39	CAP CER .01MF CK05BX K	1	1015-0002
C40	CAP CER .01MF CK05BX K	1	1015-0002
C41	CAP CER .01MF CK05BX K	1	1015-0002
C42	CAP CER .01MF CK05BX K	1	1015-0002
C43	CAP ELECT 1.0MFD 50V VERTMT	1	1010-0009
C44	CAP CER DISC .005MFD	1	1005-5049
C45	CAP ELECT 1.0MFD 50V VERTMT	1	1010-0009
C46	CAP CER .01MF CK05BX K	1	1015-0002
C47	CAP CER .01MF CK05BX K	1	1015-0002
CP1	CONN PINS PCB MOUNT	8	2250-3704
FL1	63MHZ SAW FILTER	1	1035-1500
FL2	FILTER SFE10 7MS2-A CER	1	1052-0109
L01	CHOKE RF .22UH	1	1531-0028
L02	CHOKE RF 1.0 UH	1	1530-0010
L03	CHOKE R F 100UH	1	1530-0101

CKT REF	DESCRIPTION	QTY	TFT STOCK NO.
L04	CHOKE R F 100UH	1	1530-0101
L05	CHOKE R F 15UH	1	1530-0150
L06	CHOKE R F 15UH	1	1530-0150
NU1	NUT REP 4-40	1	2111-0001
PCB1	PCB IF BOARD 9303	1	1600-3510
PCB2	PCB ASSY MIXER/FILTER	1	6608-3511
Q01	TRANS 2N3563	1	1271-3563
Q02	TRANS 2N4275	1	1271-4275
Q03	TRANS 2N4275	1	1271-4275
R01	RES CAR COMP 1/4W 5% 1K	1	1065-1001
R02	RES CAR COMP 1/4W 5% 680	1	1065-0680
R03	RES CAR COMP 1/4W 5% 51	1	1065-0051
R04	RES CAR COMP 1/4W 5% 10K	1	1065-1002
R05	RES CAR COMP 1/4W 5% 10K	1	1065-1002
R06	RES CAR COMP 1/4W 5% 220	1	1065-0220
R07	RES CAR COMP 1/4W 5% 560	1	1065-0560
R08	RES CAR COMP 1/4W 5% 220	1	1065-0220
R09	RES CAR COMP 1/4W 5% 82	1	1065-0082
R10	RES VAR 13K 10T VERT MT	1	1072-1004
R11	RES CAR COMP 1/4W 5% 68K	1	1065-6902
R12	RES CAR COMP 1/4W 5% 1K	1	1065-1001
R13	RES CAR COMP 1/4W 5% 100K	1	1065-1003
R14	RES CAR COMP 1/4W 5% 20K	1	1065-2002
R15	RES CAR COMP 1/4W 5% 10K	1	1065-1002
R16	RES VAR PC MT 10K 1T	1	1072-1002
R17	RES CAR COMP 1/4W 5% 68	1	1065-0068
R18	RES CAR COMP 1/4W 5% 51	1	1065-0051
R19	RES CAR COMP 1/4W 5% 51	1	1065-0051
R20	RES CAR COMP 1/4W 5% 2.2K	1	1065-2201
R21	RES CAR COMP 1/4W 5% 2.7K	1	1065-2701
R22	RES CAR COMP 1/4W 5% 3.9K	1	1065-3901
R23	RES CAR COMP 1/4W 5% 100K	1	1065-1003
R24	RES CAR COMP 1/4W 5% 1K	1	1065-1001
T01	XFMR T F 10.7 MHZ EBS	1	1500-0187
U01	I/C SL1611C	1	1100-1611
U02	IC SL1432 IF IF PREAMP	1	1100-1432
U03	IC NE602 MIXER OSC	1	1100-0602
U04	I/C TL604 FET SW	1	1100-0604
U05	IC NE602 MIXER OSC	1	1100-0602
U06	I/C TL604 FET SW	1	1100-0604
U07	I/C LM741CN	1	1100-0741
U08	I/C LM741CN	1	1100-0741
U09	I/C LM 317M ADJ VOLT REG	1	1100-0316
XU4	SOCKET, I/C 16 PIN	1	2250-1016
XU6	SOCKET, I/C 16 PIN	1	2250-1016
Y01	CRYSTAL 73.700 MHZ	1	2400-7370
Y02	CRYSTAL 9.85 MHZ	1	2400-0985

DWG. NO. 6601-3346 REV. 1

REVISIONS

REV	DESCRIPTION	DR	DATE	APPD
1	ENGR. RELEASE		11-16-82	
2	ADDED RESISTOR		11-16-82	
A	PILOT RELEASE		12-14-82	
B	PROD. RELEASE		5-6-83	
C	REVISED PER ECO 1627	RR	4-17-84	
D	DELETE R3 3K, R4 10K VAR POT R14 WAS 3.9K, R18 WAS 5.6K, R22 WAS 7.5K ADD C10 CHANGES FOR MODEL 8303 CONVERSION	RR	4-10-86	



REFERENCE DESIGNATORS	
LAST USED	NOT USED
R39	R2, R3, R4
U5	
CR6	
C10	

6. ⬭ = AC VOLTAGE TYPICAL VOLTAGES FOR 1mVRF INPUT
5. ▭ = DC VOLTAGE
4. ALL DC MEASUREMENTS MADE WITH NO RF INPUT
3. REF; PCB ASSY 6608-3396
   PCBD 1600-3346
2. CAPACITOR VALUES ARE IN MICROFARADS
1. RESISTOR VALUES ARE IN OHMS 1/4W 5%

NOTES: UNLESS OTHERWISE SPECIFIED

8301/83018	6608-3346
MODEL	NEXT ASSY
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ±___
DECIMAL =
2 PLACE ± ___
3 PLACE ± ___
BREAK = .010MIN
SURFACE ROUGHNESS = ___ MICROINCHES RMS MAX
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = ___ MAX
THREADS = CLASS 2
MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
MATERIAL			
FINISH			

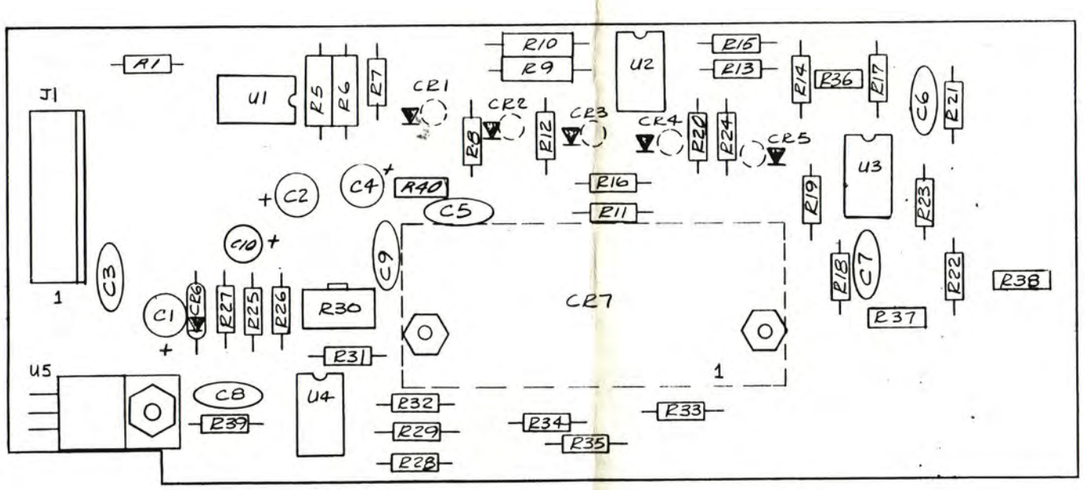
DR. BY. [illegible] 11-16-82
CK. BY.
ENGR. 5/20/83
MFG. 5/20/83
Q.A. 6/20/83
E. Kimmel 7/11/83

TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584

SCHEMATIC - RECEIVER DISPLAY

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	D	6601-3346	D
SCALE —	DO NOT SCALE PRINT	SHEET 1 OF 1	

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
1	ENG. RELEASE	[illegible]	11-15-82	
A	PILOT RELEASE	[illegible]	1-7-83	
B	PROD. RELEASE	[illegible]	5-4-83	
C	REVISED PER ECO 1629	LK	4-17-84	
D	DELETE R3, R4 ADD C10 MODEL 8303 CONVERSION	LK	4-26-86	



4. REF; SCHEMATIC 6601-3346
PC BD 1600-3346

3. FOR SCHEMATIC SEE 6601-3346 (LATEST REV.)

2. FOR PCB SEE 1600-3346 (LATEST REV.)

1. FOR MATL LIST SEE 6608-3346 (LATEST REV)

NOTES: UNLESS OTHERWISE SPECIFIED

8301B	5102-3446
8301	5102-3382
MODEL	NEXT ASSY
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ± —
DECIMAL =
2 PLACE ± —
3 PLACE ± —
BREAK = .010MIN
SURFACE ROUGHNESS = — MICROINCHES R.M.S. MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = — MAX
THREADS = CLASS 2 MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
MATERIAL			
FINISH			

DR. BY	[illegible]	5-4-83
CK. BY.		
ENGR.	[illegible]	5/26/83
MFG.	[illegible]	5/26/83
Q.A.	[illegible]	5/27/83

TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584

PCB ASSEMBLY-
RECEIVER DISPLAY

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	C	6608-3346	D

SCALE 2/1 | DO NOT SCALE PRINT | SHEET 1 OF 1

K. Krumm 5/27/83

Model 3301B

RECEIVER DISPLAY

Assembly #6608-3346
Rev. D

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
R1	RESISTOR CAR COMP 1/4W 5% 100K	1	1065-1003
R2	NOT USED		
R3	NOT USED		
R4	NOT USED		
R5	RESISTOR MT FILM 1/8W 1% 10K	2	1061-1002
R6	RESISTOR MT FILM 1/8W 1% 3.01K	1	1061-3001
R7	RESISTOR CAR COMP 1/4W 5% 390K	2	1065-3903
R8	RESISTOR CAR COMP 1/4W 5% 1K	6	1065-1001
R9	RESISTOR MT FILM 1/8W 1% 10K		1061-1002
R10	RESISTOR MT FILM 1/8W 1% 3.74K	1	1061-3741
R11	RESISTOR CAR COMP 1/4W 5% 390K		1065-3903
R12	RESISTOR CAR COMP 1/4W 5% 1K		1065-1001
R13	RESISTOR CAR COMP 1/4W 5% 10K	4	1065-1002
R14	RESISTOR CAR COMP 1/4W 5% 3K	3	1065-3001
R15	RESISTOR CAR COMP 1/4W 5% 330K	1	1065-3303
R16	RESISTOR CAR COMP 1/4W 5% 1K		1065-1001
R17	RESISTOR CAR COMP 1/4W 5% 10K		1065-1002
R18	RESISTOR CAR COMP 1/4W 5% 3K	1	1065-5601
R19	RESISTOR CAR COMP 1/4W 5% 300K	1	1065-3003
R20	RESISTOR CAR COMP 1/4W 5% 1K		1065-1001
R21	RESISTOR CAR COMP 1/4W 5% 10K		1065-1002
R22	RESISTOR CAR COMP 1/4W 5% 3K	1	1065-7501
R23	RESISTOR CAR COMP 1/4W 5% 270K	1	1065-2703
R24	RESISTOR CAR COMP 1/4W 5% 1K		1065-1001
R25	RESISTOR CAR COMP 1/4W 5% 3.9K	1	1065-3901
R26	RESISTOR CAR COMP 1/4W 5% 47K	1	1065-4702
R27	RESISTOR CAR COMP 1/4W 5% 10K		1065-1002
R28	RESISTOR CAR COMP 1/4W 5% 56K	1	1065-5602
R29	RESISTOR CAR COMP 1/4W 5% 2.2K	1	1065-2201
R30	RESISTOR VARIABLE 1T 2K	1	1072-2001
R31	RESISTOR CAR COMP 1/4W 5% 270	1	1065-0270
R32	RESISTOR CAR COMP 1/4W 5% 1K		1065-1001
R33	RESISTOR CAR COMP 1/4W 5% 51	1	1065-0051
R34	RESISTOR MT FILM 1/8W 1% 2K	1	1061-2001
R35	RESISTOR MT FILM 1/8W 1% 5.23K	1	1061-5231
R36	RESISTOR VARIABLE 1T 2K	4	1069-0203
R37	RESISTOR VARIABLE 1T 2K		1069-0203
R38	RESISTOR VARIABLE 1T 2K		1069-0203
R39	RESISTOR CAR COMP 1/4W 5% 100	1	1065-0100
R40	RESISTOR VARIABLE 1T 2K		1069-0203
C1	CAPACITOR VERT MOUNT 25V 10UFD	4	1010-0099
C2	CAPACITOR VERT MOUNT 25V 10UFD		1010-0099
C3	CAPACITOR CERAMIC 25V .01UFD	1	1005-1039
C4	CAPACITOR VERT MOUNT 25V 10UFD		1010-0099
C5	CAPACITOR MONO 50V .1UFD	5	1016-0010
C6	CAPACITOR MONO 50V .1UFD		1016-0010
C7	CAPACITOR MONO 50V .1UFD		1016-0010
C8	CAPACITOR MONO 50V .1UFD		1016-0010
C9	CAPACITOR MONO 50V .1UFD		1016-0010
C10	CAPACITOR VERT MOUNT 25V 10 UFD		1010-0099

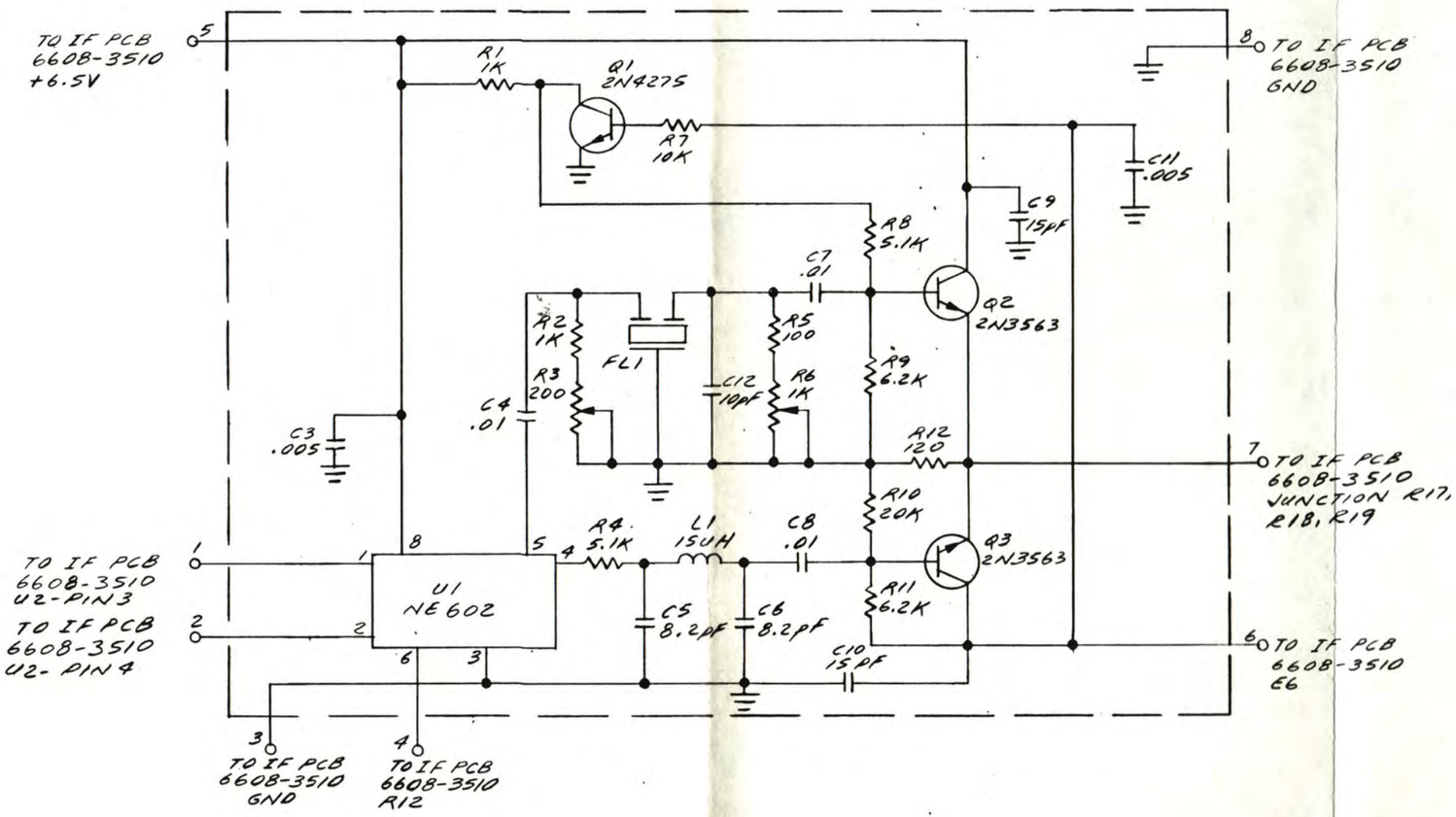
Model 8301B

RECEIVER DISPLAY

Assembly #6608- 3346
Rev. D

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
CR1	DIODE LED HP5082-4487	5	1285-4487
CR2	DIODE LED HP5082-4487		1285-4487
CR3	DIODE LED HP5082-4487		1285-4487
CR4	DIODE LED HP5082-4487		1285-4487
CR5	DIODE LED HP5082-4487		1285-4487
CR6	DIODE HOT CARR.	1	1282-2800
CR7	LED BAR GRAPH ARRAY WITH DRIVER	1	1285-3916
U1	I.C. LM1458	3	1101-1458
U2	I.C. LM1458		1101-1458
U3	I.C. LM1458		1101-1458
U4	I.C. LF353	1	1100-0353
U5	I.C LM340T-12	1	1100-0340
	WASHER #4	2	2112-0040
	WASHER BLK	2	2112-0003
	SCREW PH 4-40 X 3/8	2	2104-0007
	NUT KEPT 4-40	2	2111-0001
	SCREW PH 4-40 X 1/4	1	2104-0001
	PCB	1	1600-3346
J1	PLUG 6 PIN MOLEX	1	2250-6006
	I.C. SOCKET 8 PIN	4	2250-1008

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	RELEASED TO P.LOD	4-2-86	



3. PCB ASSY AND P/L 6608-3511
   PCB FAB 1600-3511
2. CAPACITOR VALUES ARE IN MICROFARADS.
1. RESISTOR VALUES ARE IN OHMS 1/4W 5%.

NOTE: UNLESS OTHERWISE SPECIFIED,

APPROVALS	DATE
DRAWN K	
ENGR Y.S. LAW	4/15/86
MFG.	
Q.A.	

TEN INC

A2-A3 MIXER/FILTER

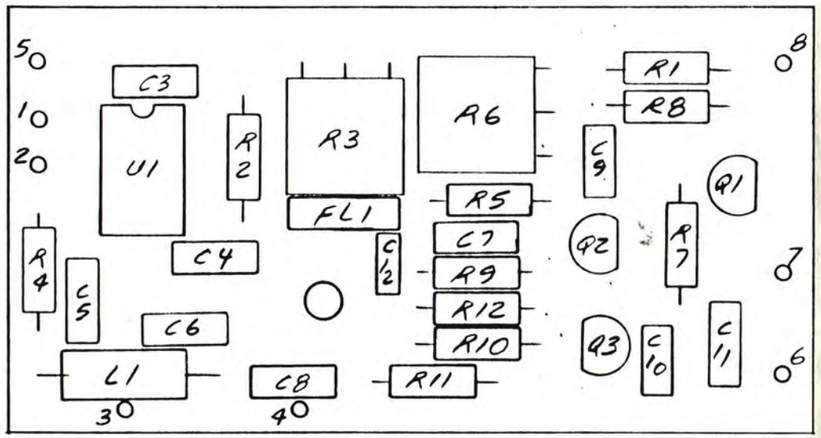
SIZE	FSCM NO.	DWG. NO.	REV.
C		6601-3511	A

SCALE NONE | MODEL 83018 | SHEET 1 OF 1

DWG. NO.	SH	REV.

REVISIONS

REV.	DESCRIPTION	DATE	APPROVED
A	RELEASED TO PROD	4-10-86	



NOTE:

1. REF DWG;
   SCHEMATIC 6601-3511
   PCB FAB 1600-3511

QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION

PARTS LIST

6608-3510	83018
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN K	4/10/86
CHECKED J.S.LAW	4/15/86
ISSUED	

TIME & FREQUENCY TECHNOLOGY INC.

PCB ASSY
MIXER/FILTER

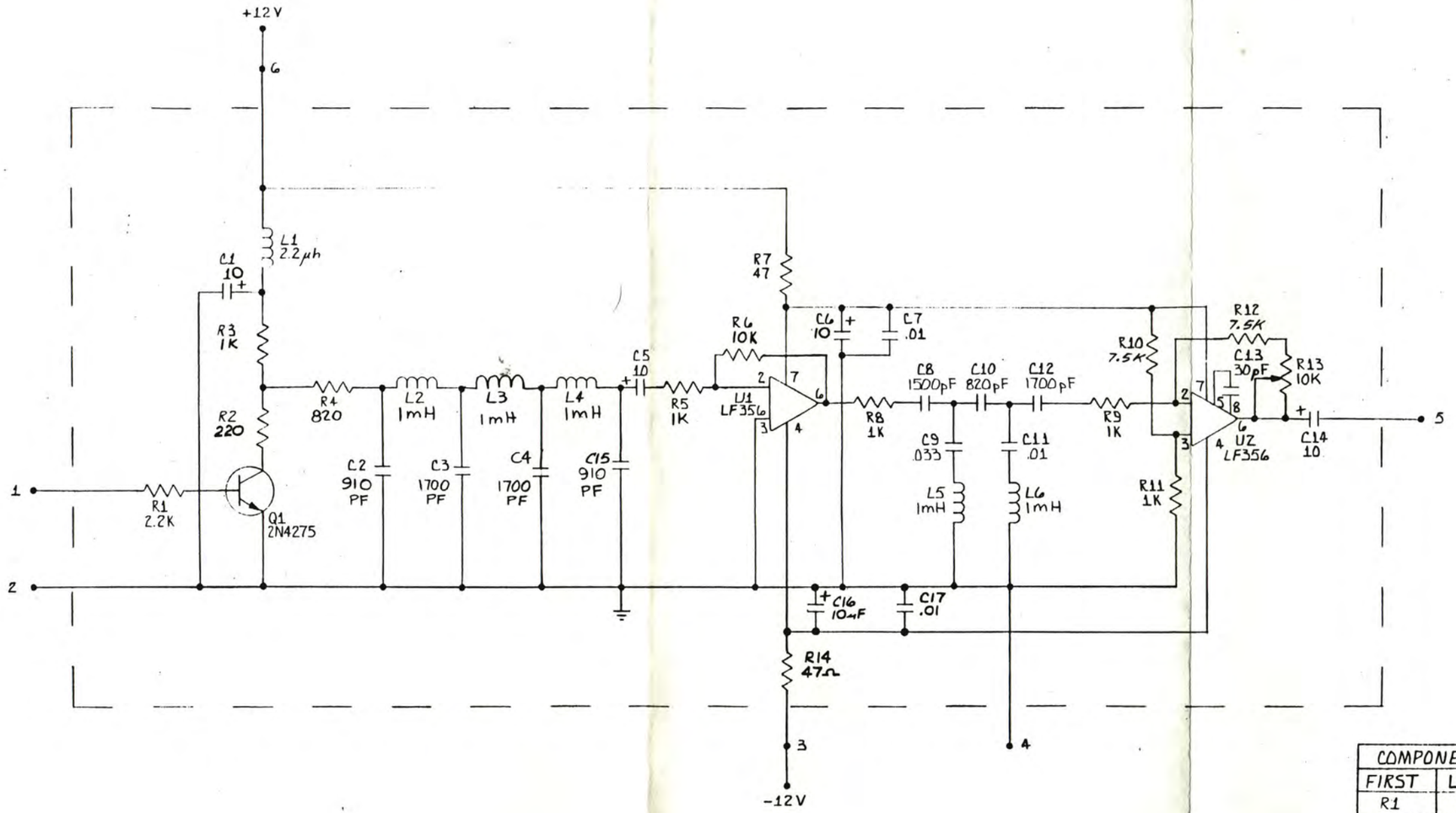
SIZE	FSCM NO.	DWG. NO.	REV.
B		6608-3511	A

SCALE 2/1 SHEET 1 OF 1

Model 8301B MIXER/FILTER ASSEMBLY ASSEMBLY NO: 6608-3511

CKT REF	DESCRIPTION	QTY	TFT STOCK NO.
C03	CAP CER DISC .005MFD	1	1005-5049
C04	CAP CER .01MF CK05BX K	1	1015-0002
C05	CAP MINI CER 8.2 PF NPO RECT	1	1017-0082
C06	CAP MINI CER 8.2 PF NPO RECT	1	1017-0082
C07	CAP CER .01MF CK05BX K	1	1015-0002
C08	CAP CER .01MF CK05BX K	1	1015-0002
C09	CAP MINI CER 15PF NPO RECT	1	1017-0150
C10	CAP MINI CER 15PF NPO RECT	1	1017-0150
C11	CAP CER DISC .005MFD	1	1005-5049
FL1	FIL CER 10.7MHZ SFE 10.7MZ2	1	1052-0111
L01	CHOKE RF 1.0 UH	1	1530-0010
PC31	PCB MIXER/FILTER	1	1600-3511
Q01	TRANS 2N4275	1	1271-4275
Q02	TRANS 2N3563	1	1271-3563
Q03	TRANS 2N3563	1	1271-3563
R01	RES CAR COMP 1/4W 5% 1K	1	1065-1001
R02	RES CAR COMP 1/4W 5% 270	1	1065-0270
R03	RES VAR PC MT 200 1T	1	1072-0200
R04	RES CAR COMP 1/4W 5% 5.1K	1	1065-5101
R05	RES CAR COMP 1/4W 5% 270	1	1065-0270
R06	RES VAR PC MT 200 1T	1	1072-0200
R07	RES CAR COMP 1/4W 5% 10K	1	1065-1002
R08	RES CAR COMP 1/4W 5% 5.1K	1	1065-5101
R09	RES CAR COMP 1/4W 5% 5.1K	1	1065-5101
R10	RES CAR COMP 1/4W 5% 5.1K	1	1065-5101
R11	RES CAR COMP 1/4W 5% 5.1K	1	1065-5101
R12	RES CAR COMP 1/4W 5% 120	1	1065-0120
U01	IC NE602 MIXER OSC	1	1100-0602

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	ENGR. REL	10-19-81	J.W.
	B	REVISED PER ECO 1690	4-19-84	



COMPONENT DESIGNATOR		
FIRST	LAST	NOT USED
R1	R14	
C1	C17	
L1	L6	
Q1		
U1	U2	

NOTE: UNLESS OTHERWISE SPECIFIED
1. RESISTOR VALUES ARE IN OHMS - 1/4W - ±5%.
2. CAPACITOR VALUES ARE IN MICROFARADS.
3. INDUCTOR VALUES ARE IN MILLIHENRIES.

		APPROVALS	DATE
8301		DRAWN	6-30-81
7723 7223		ENGR.	1-26-82
7707	6608-3334	MFG.	12/3/82
MODEL	N/A	Q.A.	12/3/82

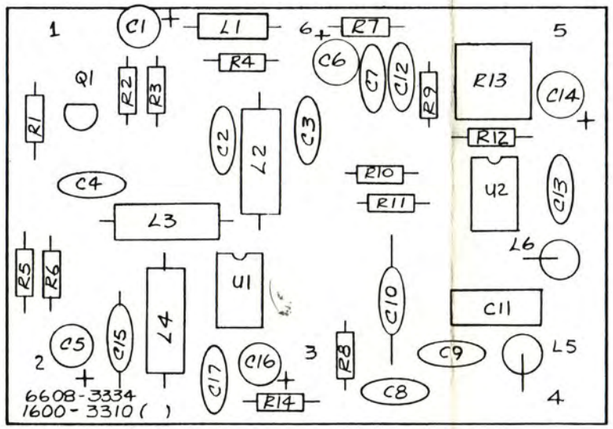
TIME & FREQUENCY TECHNOLOGY INC.

FILTER - AMPLIFIER
110 KHz LPF / 220KHz HPF

SIZE	FSCM NO.	DWG. NO.	REV.
C		6601-3334	B

SCALE — SHEET 1 of 1

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	ENGR. REL			
B	REVISED PER ECO 1640	KK	4-19-84	



1. MAKE FROM PCB 1600-3310 (LATEST REV)

NOTES: UNLESS OTHERWISE SPECIFIED

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
			MATERIAL
			FINISH

DR. BY. L. Andrie	12-4-81	
CK. BY. W. Mathyson	12/9/81	
ENGR. M. Shanklin	1-26-82	
MFG. [illegible]	1/25/82	
Q.A. [illegible]	1/26/82	
2 K. Kinnison	11/24/82	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ±___
DECIMAL =
2 PLACE ±___
3 PLACE ±___
BREAK = .010MIN
SURFACE ROUGHNESS = ___MICROINCHES RMS: MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = ___MAX
THREADS = CLASS 2 MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

MODEL	NEXT ASSY
8301	
7713, 7723	
7707	6608-3334
APPLICATION	

TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584

PCB ASSEMBLY
110KHz / 220KHz FILTER AMP

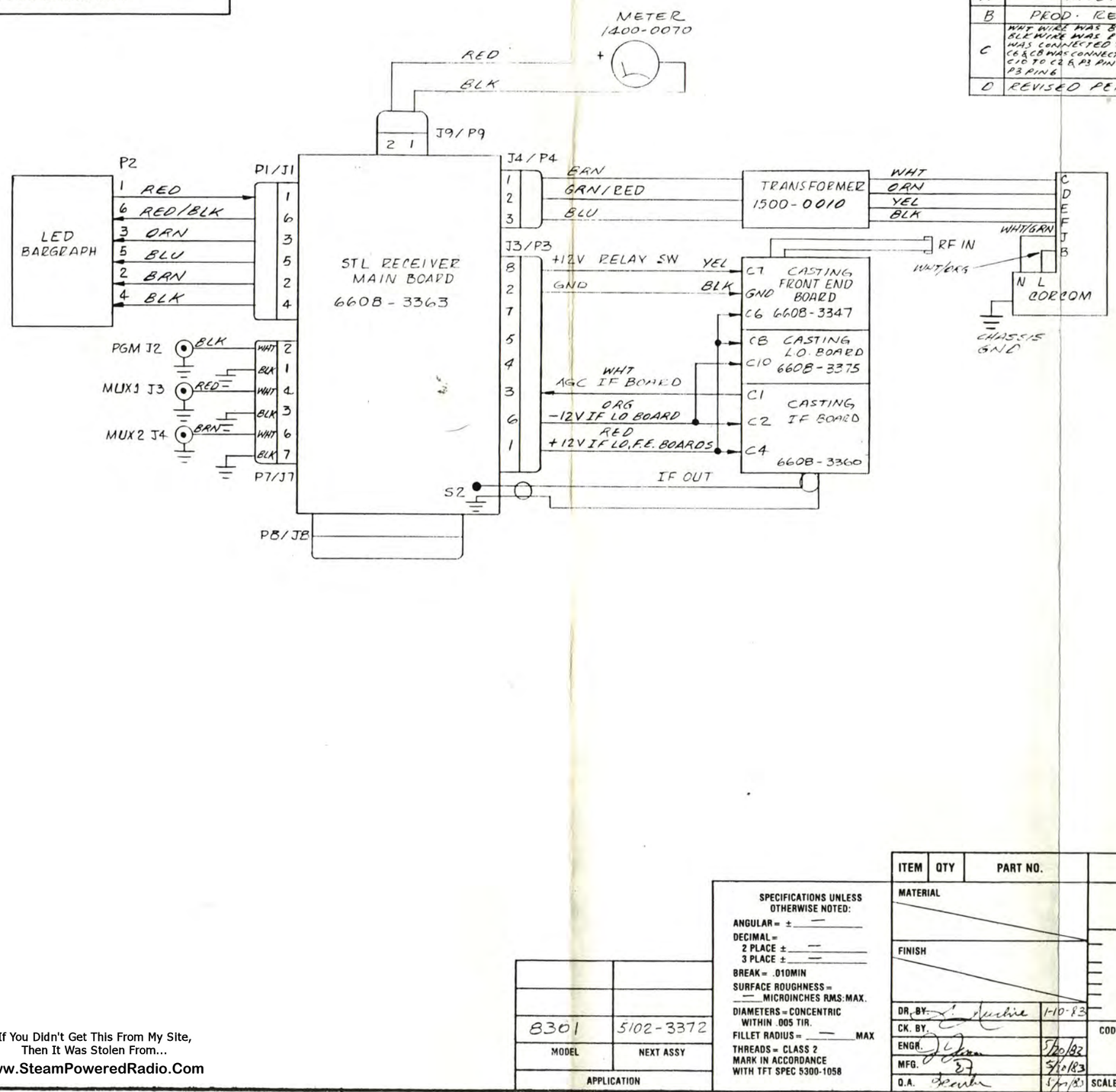
CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	C	6608-3334	B

SCALE NONE | DO NOT SCALE PRINT | SHEET 1 OF 1

Model 7707,7713,7723,8301 — Assembly #6608-3334
110KHz/220 KHz FILTER AMP — Rev.B

CKT REF	DESCRIPTION	QTY	TFT STOCK NO
R1	RES CAR COMP 1/4W 5% 2.2K	1	1065-2201
R2	RES CAR COMP 1/4W 5% 220	1	1065-0220
R3	RES CAR COMP 1/4W 5% 1K	5	1065-1001
R4	RES CAR COMP 1/4W 5% 820	1	1065-0820
R5	RES CAR COMP 1/4W 5% 1K		1065-1001
R6	RES CAR COMP 1/4W 5% 10K	1	1065-1002
R7	RES CAR COMP 1/4W 5% 47	2	1065-0047
R8	RES CAR COMP 1/4W 5% 1K		1065-1001
R9	RES CAR COMP 1/4W 5% 1K		1065-1001
R10	RES CAR COMP 1/4W 5% 20K	1	1065-2002
R11	RES CAR COMP 1/4W 5% 1K		1065-1001
R12	RES CAR COMP 1/4W 5% 7.5K	1	1065-7501
R13	RES VAR P.C. MT 10K 1T	1	1072-1002
R14	RES CAR COMP 1/4W 5% 47		1065-0047
C1	CAP ELECT 10MFD 16V VERT MT.	5	1010-0099
C2	CAP MICA 910PF	2	1001-0911
C3	CAP MICA 1700PF	3	1001-0172
C4	CAP MICA 1700PF		1001-0172
C5	CAP ELECT 10MFD 16V VERT MT.		1010-0099
C6	CAP ELECT 10MFD 16V VERT MT.		1010-0099
C7	CAP CER DISC .01UF/25V	2	1005-1039
C8	CAP MICA 1500PF	1	1001-0152
C9	CAP POLY .033UF 100V	1	1002-0331
C10	CAP MICA 820 PF	1	1001-0821
C11	CAP POLY .01UF 100V	1	1002-0011
C12	CAP MICA 1700PF		1001-0172
C13	CAP MICA 30 PF	1	1001-0300
C14	CAP ELECT 10MFD 16V VERT MT		1010-0099
C15	CAP MICA 910 PF		1001-0911
C16	CAP ELECT 10MFD 16V VERT MT		1010-0099
C17	CAP CER DISC .01UF/25V		1005-1039
L1	CHOKE 2.2UH	1	1530-0020
L2	CHOKE RF 1.0 MH	5	1530-1004
L3	CHOKE RF 1.0 MH		1530-1004
L4	CHOKE RF 1.0 MH		1530-1004
L5	CHOKE RF 1.0 MH		1530-1004
L6	CHOKE RF 1.0 MH		1530-1004
U1	I/C LF356	2	1100-0356
U2	I/C LF356		1100-0356
Q1	TRANS 2N4275	1	1271-4275
	CONNECTOR PINS (SOLDER SIDE)	6	2250-3704
	PCB FILTER AMP	1	1600-3310

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	PILOT RELEASE		1-10-83	
B	PROD. RELEASE		5-3-83	
C	WHT WIRE WAS BLK, BRN WIRE WAS RED WIRE WAS BLK/GRN, CONNECTION C6 P2 PIN 6 WAS CONNECTED TO C6, P3 PIN 7, CONNECTIONS ON C8 & C8 WAS CONNECTED TO P3 PIN 5, CONNECTION C10 TO C2 & P3 PIN 6 WAS CONNECTED TO C10 P3 PIN 6	RLC	4-19-84	
D	REVISED PER ECO 1663	RLC	10-26-84	



8301	5102-3372
MODEL	NEXT ASSY
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ± —
DECIMAL =
2 PLACE ± —
3 PLACE ± —
BREAK = .010MIN
SURFACE ROUGHNESS = — MICROINCHES RMS: MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = — MAX
THREADS = CLASS 2 MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
			MATERIAL
			FINISH

DR. BY.	L. Hutchins	1-10-83
CK. BY.		
ENGR.	J. Dixon	5/20/83
MFG.	[illegible]	5/10/83
Q.A.	[illegible]	5/10/83

TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584

WIRING DIAGRAM-
STL RECEIVER

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	C	6600-2244	D
SCALE —	DO NOT SCALE PRINT	SHEET 1 OF 1	

K. Kriessman 5/10/83

Model 8301 SYSTEM WIRING DIAGRAM Assembly #6600-2244
Rev. D

CKT REF	DESCRIPTION	QTY	TFT STOCK NO.
	Filter Fuse Holder	1	1910-0006
	Fuse - 15A SB	1	1900-0012
	Conn BNC CH. MT.	3	2200-7935
	Binding Post	1	2260-0002
	Transformer Assy	1	5102-3381
	RF Filter	1	1052-0018
	PCB Connector	1	2250-8902

P/N 5004-7773
REVISION D
DATE Nov. 86
EQUIPMENT SERIAL NO. _____
SHIPMENT DATE _____

PART E

MODEL 7773 RECEIVER AUTOMATIC CHANGEOVER

TFT, INC.
3090 Oakmead Village Drive
Santa Clara, CA 95051
TEL (408) 727-7272 TWX 910-338-0584
FAX (408) 727-5942

TABLE OF CONTENTS

SECTION E1

GENERAL INFORMATION

E1.1 General Description

The Model 7773 Automatic Changeover is used in an STL Hot Standby Receiver System to automatically switch the audio output from the operating receiver to the standby if there is a failure of either the power supply voltages or the received signal level in the operating receiver.

The Model 7773 is 1 3/4" high and mounts in a standard 19-inch relay rack at the transmitter site.

E1.2 Specifications

Power Required	+12V dc (supplied by receivers)
Temperature Range	$-10^{o}C$ to $+50^{o}C$
Dimensions	1 3/4 x 8 x 17
Weight	3 Lb.

SECTION E2

INSTALLATION

Installation instructions for the Model 7773 Automatic Changeover Unit are contained in Section A2 of Part A of this manual.

SECTION E3

OPERATION

Operating instructions for the Model 7773 Automatic Changeover Unit are contained in Section A3 of Part A of this manual.

SECTION E4

THEORY OF OPERATION

E4.1 General

The Model 7773 Automatic Changeover monitors the power supply voltages and the RF signal levels in the two receivers, and switches the audio output from the receiver in use to the standby receiver if there is a failure of either the supply voltages or the signal level in the receiver in use (see Drawing No. 6600-2203). The unit also provides the circuitry for switching audio output from one receiver to the other by means of a front-panel switch. Power supply switching has top priority, manual switching second priority, and RF level switch third priority. That is, receivers will be switched whenever there is a failure of the power supplies in the receiver in use. Manual switching cannot override a switch made for failed power supplies, but can switch to a receiver even though its RF signal level is below the acceptable value. Switching for low RF signal level can take place only if the power supply for the receiver to be switched to is operating properly.

The Automatic Changeover unit contains two major components -- the Splitter Board and the Switch Board. The Splitter Board is an RF power splitter that allows the two receivers to operate from the same antenna. All of the monitoring and control is done by the Switch Board, which is described in subsection E4.2.

E4.2 Switch Board Schematic Diagram Discussion (Drawing No. 6601-3309)

The -12 V input from Receiver A at pin 1 of J1 normally keeps Q1 turned off, and thus delivers a logic 1 to pin 15 of U4. If, however, the -12 V supply fails, Q1 is turned on and delivers a logic 0 to pin 15 of U4. Likewise, the normal +12 V input from Receiver A causes Q2 and Q3 to deliver a logic 1 to U4-15, but a failure of the +12 V supply delivers a logic 0 to U4-15.

In the same way, the power supplies from Receiver B are applied to the circuitry of Q4, Q5, and Q6 to deliver a logic 1 to pin 1 of U4 if the power supplies are operating, and a logic 0 to U4-1 if they are not.

U4 is a magnitude comparator which outputs a high at pin 5 and a low at pin 7 whenever an A input is greater than its paired B input (e.g., A_1 greater than B_1). Also, a high at pin 7 and a low at pin 5 are produced when a B input is greater than an A input. If inputs A_3=B_3 then the

output would depend on the next pair of inputs (A_2 and B_2). The A_3/B_3 pair has the highest priority; that is, $A_3 > B_3$ will produce a 1 at pin 5 regardless of the values of A_2/B_2, A_1/B_1, and A_0/B_0. A_0 B_0 will produce a 1 at pin 5 and a 0 at pin 7 only if $A_3=B_3$, $A_2=A_2$, and $A_1=B_1$. All inputs could be logic 1 or (A=B) except A_0 and B_0. There are only two cases for A_0 and B_0, either $A_0 > B_0$ or $A_0 < B_0$ because of U2 (RS-FF). This assures that pin 5 and 7 would never be equal.

When U4 outputs a logic 1 at pin 5 (A B), it turns on Q10 which de-energizes a relay in Receiver B and thus switches off the Receiver B audio output. Q10 will also short pin 2 of J3 to ground and thus light the front-panel RxA LED. While pin 5 of U4 is high, pin 7 of U4 will be low. This low turns off Q9, which causes a relay in Receiver A to energize and thus switch on the Receiver A audio. If B is greater than A, U4-7 outputs a logic 1 to cause Q9 to switch off Receiver A and turn on the RXB LED. U4-5 will be low, turning off Q10 and thus energizing the audio output relay in Receiver B.

The front-panel switch can also be used to switch receivers. The switch is normally in the center-off position, which permits automatic switching for failed power supplies or low RF signal. If the switch is moved to the RxA position, a ground is placed on pin 7 of J3, delivering a logic 0 to U4-14. Since this makes A_2 greater than B_2, U4-7 will be low (provided the power supplies of both receivers are operating normally so that $A_3=B_3$); and the low at U4-7 turns on the audio output from Receiver A as described in the preceding paragraph. If the front-panel switch is moved to the RxB position, the resulting low at U4-13 turns on the Receiver B audio.

RF signal failure in the receiver in use can also cause the Switch Board to switch to the other receiver. A TTL input from a squelc circuit in Receiver A is brought into the board at pin 6 of J1; this input is +12V if the received signal level is above 40 UF, and -12 if the received signal level is below that value. When the Receiver A received signal is good, the low at the collector of Q8 is delivered through U1-11 as a high to U4-12. Likewise, a good received signal in Receiver B produces +12V at J2-6, which is delivered through Q7 and U2-3 to U4-11 as a high. If, for example, Receiver B has RF failure, then Q7 would be logic 1; therefore, it results U4-11 a logic 0 and U4-12 a logic 1, or A1 will be greater than B1 at the input to U4, and the Receiver A audio output will be selected.

Whenever A becomes greater than B at any pair of inputs to U4, pin 7 of U4 goes low, setting the latch consisting of U2-8 and U2-11. As a result, pin 8 of U2 is high and pin 11 of U2 is low, making $A_0 > B_0$ at U4 and holding U4-5 high and U4-7 low. This state continues even if A=B for the other three input pairs to U4; only if B becomes greater than A in one of the pairs, resetting the latch, does B_0 become greater than A_0 to

allow the U4 output to change. The purpose of this action is to prevent an automatic switch in receivers when RF level or power supply voltages are restored following a failure.

If the RF signals in both receivers fail, the collectors of Q7 and Q8 will go high causing U1-3 to go low. Timer U5 runs continuously, producing a 1-second square wave at U5-3. The low at U1-3 is inverted by U1-6 to gate the square wave through U1-8 to U2-1, causing the Receiver B level at U4-11 to go alternately high and low every half second. The U2-3 output also gates the Receiver A level from the collector of Q8 through U1-11 to U4-12 every half second. Because of the inversion in U1-11, the levels at pins 11 and 12 of U4 are 180 degress out of phase. Thus the receivers are switched back and forth until one receiver regains its RF signal, at which time U1-8 gates off the square wave and operation switches to the good receiver.

Power for the Switch Board at 5V dc is obtained from the +12V supplies of both receivers through diodes CR3 and CR4 and regulator U3. Thus the board will continue to operate even if one +12V supply fails.

SECTION E5

MAINTENANCE

Maintenance instructions for the Model 7773 Automatic Changeover are contained in Section D of Part D of this manual.

SECTION E6

MODEL 7773 AUTOMATIC CHANGEOVER DIAGRAMS

DWG. NO. 6601-3309	SH. 1	REV. C

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	C	ENG. REL.	11-23-81	DCM

MICRO

RXA SUPPLY J1
- 12V
+ 12V
R1 27K
R2 12K
R3 4.7K
R4 2K
Q1 2N4275
R5 4.7K
R6 10K
Q2 2N4275
Q3 2N4275
R7 1K

CR3 IN4001
CR4 IN4001
U3 340-5
+5V
TP1
C7 10
C8 .01

RXB SUPPLY J2
- 12V
+ 12V
R8 27K
R9 12K
R10 4.7K
R11 2K
Q4 2N4275
R12 10K
R13 4.7K
Q5 2N4275
Q6 2N4275
R14 1K

SWITCH J3
RXB
RXA

RXB J2
R15 15K
R16 4.7K
Q7 2N4275
R32 47K
CR1 IN4001

RXA J1
R18 15K
R19 4.7K
Q8 2N4275
R33 47K
CR2 IN4001

RF

R17 4.7K
R20 4.7K
R21 4.7K
R22 4.7K

U1 74LS00
U2 74LS00

R23 4.7K
R24 4.7K
R26 4.7K
R25 2K
R27 2K
Q9 2N2222
Q10 2N2222
R30 300
R31 300

U4 74LS85
A>B
A<B
A=B
A_3 B_3 A_2 B_2 A_1 B_1 A_0 B_0

U5 NE555
R28 8.2K
R29 68K
C10 10
C9 .01

RX4 LED J3
CR5 IN4001
RF SWITCH J4
RXA J1
RXB J2
RXB LED J3

COMPONENT DESIGNATOR		
FIRST	LAST	NOT USED
C7	C10	C1,2,3,4,5,6
R1	R33	
CR1	CR5	
Q1	Q10	
U1	U5	
J1	J4	

NOTE: UNLESS OTHERWISE SPECIFIED
1. RESISTOR VALUES ARE IN OHMS - 1/4W - ±5%.
2. CAPACITOR VALUES ARE IN MICROFARADS.

CONTRACT NO.		APPROVALS	DATE
		DRAWN DMC	6/23/81
7773	6608-3309	MFG QT.	12/1/82
MODEL	N/A	ENGR [illegible]	1-26-82
		QA [illegible]	1/31/82

MET TIME & FREQUENCY TECHNOLOGY INC.

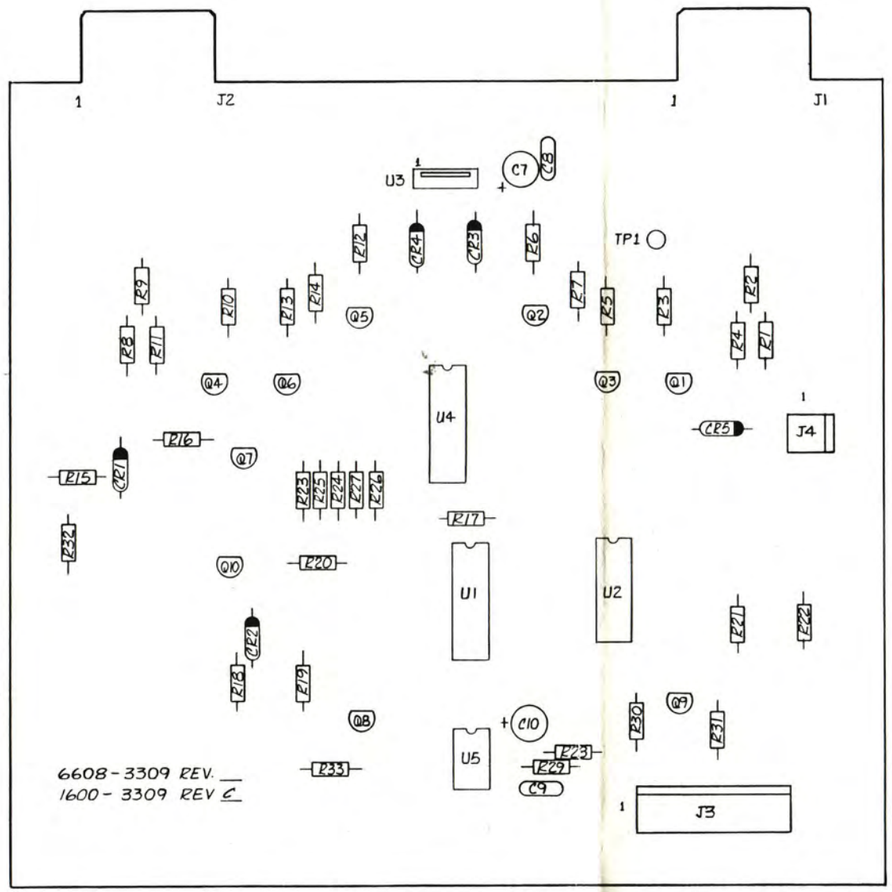
RCVR INTERFACE SWITCH

SIZE	FSCM NO.	DWG. NO.	REV.
D		6601-3309	C
SCALE —		SHEET 1 OF 1	

DWG. NO. 6608-3309	SH 1	REV.

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	ENGR. REL.	2-5-82	
	B	RELEASED TO PRODUCTION	2-10-82	



1. MAKE FROM PCB 1600-3309 (LATEST REV.)

NOTES: UNLESS OTHERWISE SPECIFIED

		CONTRACT NO.		TIME & FREQUENCY TECHNOLOGY INC.
		APPROVALS	DATE	PC BOARD ASSEMBLY - INTERFACE SWITCH
		DRAWN	12-29-81	
		CHECKED	12/29/81	
7773	5102-3356	ISSUED		SIZE D | FSCM NO. | DWG. NO. 6608-3309 | REV B
MODEL	NEXT ASSY		1-26-82	SCALE 2/1 | SHEET 1 OF 1

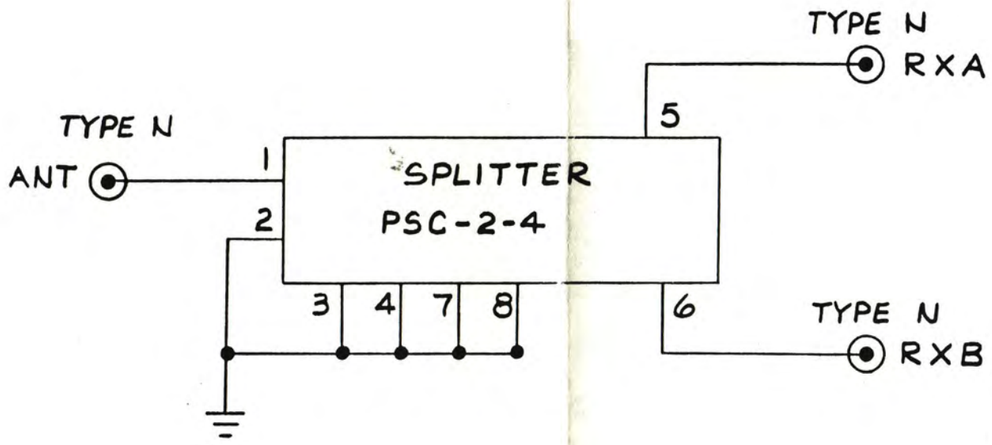
CKT REF	DESCRIPTION		QTY	TFT STOCK NO.
C7	Cap Elect. Vert Mnt 35V	10uF	2	1010-0099
C8	Cap Disc Cer	.01	2	1005-1039
C9	Cap Disc Cer	.01		1005-1039
C10	Cap Elect. Vert Mnt 35V	10uF		1010-0099
CR1	Dio IN4001		5	1284-4001
CR2	Dio IN4001			1284-4001
CR3	Dio IN4001			1284-4001
CR4	Dio IN4001			1284-4001
CR5	Dio IN4001			1284-4001
J3	Connector Molex 7 Pin		1	2250-6007
J4	Connector Molex 2 Pin		1	2250-6002
Q1	Trans 2N4275		8	1271-4275
Q2	Trans 2N4275			1271-4275
Q3	Trans 2N4275			1271-4275
Q4	Trans 2N4275			1271-4275
Q5	Trans 2N4275			1271-4275
Q6	Trans 2N4275			1271-4275
Q7	Trans 2N4275			1271-4275
Q9	Trans 2N2222		2	1271-2222
Q10	Trans 2N2222			1271-2222
R1	Res 1/4W 5% Carb. Comp	27K	2	1065-2702
R2	Res 1/4W 5% Carb. Comp	12K	2	1065-1202
R3	Res 1/4W 5% Carb Comp	4.7K	13	1065-4701
R4	Res 1/4W 5% Carb. Comp	2K	3	1065-2001
R5	Res 1/4W 5% Carb. Comp	4.7K		1065-4701
R6	Res 1/4W 5% Carb. Comp	10K	2	1065-1002
R7	Res 1/4W 5% Carb. Comp	1K	2	1065-1001
R8	Res 1/4W 5% Carb. Comp	27K		1065-2702
R9	Res 1/4W 5% Carb. Comp	12K		1065-1202
R10	Res 1/4W 5% Carb. Comp	4.7K		1065-4701
R11	Res 1/4W 5% Carb. Comp	2K		1065-2001
R12	Res 1/4W 5% Carb. Comp	10K		1065-1002
R13	Res 1/4W 5% Carb. Comp	4.7K		1065-4701
R14	Res 1/4W 5% Carb. Comp	1K		1065-1001
R15	Res 1/4W 5% Carb. Comp	15K	2	1065-1502
R16	Res 1/4W 5% Carb. Comp	4.7K		1065-4701
R17	Res 1/4W 5% Carb. Comp	4.7K		1065-4701
R18	Res 1/4W 5% Carb. Comp	15K		1065-1502
R19	Res 1/4W 5% Carb. Comp	4.7K		1065-4701

CKT REF	DESCRIPTION		QTY	TFT STOCK NO.
R20	Res 1/4W 5% Carb. Comp	4.7K		1065-4701
R21	Res 1/4W 5% Carb. Comp	4.7K		1065-4701
R22	Res 1/4W 5% Carb. Comp	4.7K		1065-4701
R23	Res 1/4W 5% Carb. Comp	4.7K		1065-4701
R24	Res 1/4W 5% Carb. Comp	4.7K		1065-4701
R25	Res 1/4W 5% Carb. Comp	2K		1065-2001
R26	Res 1/4W 5% Carb. Comp	4.7K		1065-4701
R27	Res 1/4W 5% Carb. Comp	2K		1065-2001
R28	Res 1/4W 5% Carb. Comp	8.2K	1	1065-8201
R29	Res 1/4W 5% Carb. Comp	68K	1	1065-6802
R30	Res 1/4W 5% Carb. Comp	300	2	1065-0300
R31	Res 1/4W 5% Carb. Comp	300		1065-0300
R32	Res 1/4W 5% Carb. Comp	47K	2	1065-4702
R33	Res 1/4W 5% Carb. Comp	47K		1065-4702
U1	IC 74LS00		2	1101-7400
U2	IC 74LS00			1101-7400
U3	IC 340-5		1	1101-7805
U4	IC 74LS85		1	1101-7485
U5	IC NE555		1	1100-0555
	Interface Switch PCB		1	1608-3309

DWG. NO.	SH	REV.

REVISIONS

REV.	DESCRIPTION	DATE	APPROVED
A	ENGR REL	10/15/81	DM



	QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	

PARTS LIST

6608-3316	7773
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN Joe Vasquez	8-25-81
CHECKED M. Gratt	1-26-82
ISSUED	

TIME & FREQUENCY TECHNOLOGY INC.

SPLITTER SCHEMATIC

SIZE	FSCM NO.	DWG. NO.	REV.
B		6601-3316	A

SCALE —

SHEET 1 OF 1

BISHOP GRAPHICS/ACCUPRESS
REORDER NO. A-4105

P/N 5004-8300
REVISION D
DATE 9-24-86
EQUIPMENT SERIAL NO. _____
SHIPMENT DATE _____

T F T

STEREO DECODER BOARD OPTION

PART F

TFT, INC.
3090 Oakmead Village Drive
Santa Clara, CA 95051
TEL (408) 727-7272 TWX 910-338-0584
FAX (408) 727-5942

SECTION F

Stereo Decoder Board Option

TABLE OF CONTENTS

SECTION F

GENERAL INFORMATION

F1.1 System Description

The TFT stereo decoder option B for use at the broadcast transmitter in the 8301/7707 STL receiver to demodulate composit audio into separate left and right audio outputs. The option is a single PC Board which mounts into a ten pin molex connector, J8, or J9, on the receiver main board.

F1.2 Stereo Decoder Option

Distortion.....<0.5% at 1 KHz

S/N.....>60 dB

Stereo Separation.....>40 dB 50 Hz to 10 KHz

Frequency Response.....±1 dB 50 KHz to 12.5 KHz

Output level.....+10 dB (600 ohm Load)

SECTION F2

INSTALLATION

F2.1 Unpacking and Inspection

Upon receiving the option, inspect the packing box and board for signs of possible shipping damage. Keep all packing material until performance is confirmed. If anything is damaged or missing, file a claim with the transportation company, or with the insurance company if insured separately.

F2.2 Installation and Connection

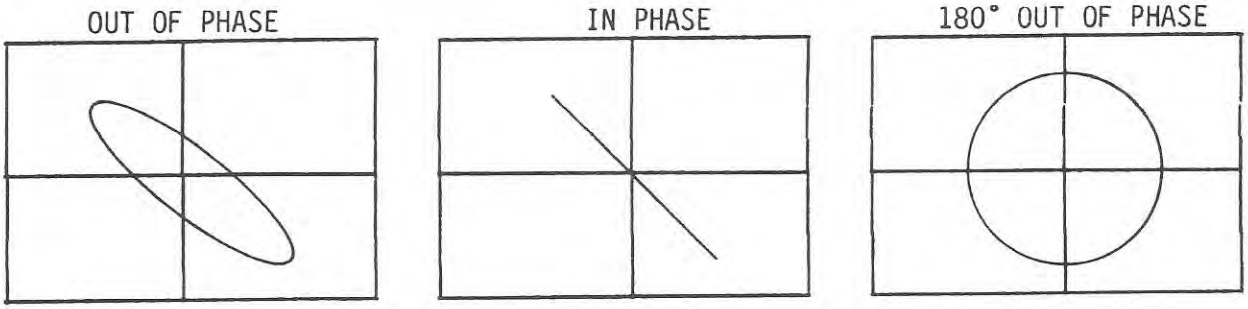
The stereo decoder board is designed to be plugged into the 8301 or 7707 main board, J8 or J9 Molex connector, which is located at the rear, right side of the main board as facing the unit. Although the space is minimal, the board will fit without removing the coaxial filter on rear panel. The component side of the stereo decoder board should face away from the RF casting when the installation is complete.

After installing the board, all the necessary connections are made interfacing the stereo decoder board to the main board. The rear panel connections on the 8301 are as follows: Left "+" output, pin 1 on J5. Left "-" output, Pin 2 on J5. Right "+" output, pin 3 on J5. Right "-" output, pin 4 on J5. All outputs are ment to be terminated into a 600 ohm load. On the 7707 the Left "+" output is J2-8. Left "-" is J2-9. Right "-" is J2-10. Right "+" output is J2-11.

The installation of the stereo decoder board option is now complete.

F2.3 Adjustment

Modulate both channels of the stereo generator with a 400 Hz signal. With an oscilloscope connected in the X-Y mode, to the right and left channel outputs of the 8301/7707. Adjust R15 for a single line on the scope. This indicates both signals are perfectly in phase. Adjust R24 for the left channel for proper output level. Any adjustment of R3 or R7 will degrade the performance of the stereo decoder.



F2-1

SECTION F3

OPERATION

F3.1 General

Composite audio from the main board enters the stereo decoder board at J8 or J9 pin 6 and on to pin 2 of U1. U1 is a high performance PLL FM stereo demodulator with a pilot cancel feature. Potentiometer R is used to effectively null the 19kHz pilot signal in the demodulator IC which has very little phase shifting effect on the audio. This contributes to the options' low distortion characteristics.

F3.2 Controls and Operation

Control R7 adjusts the VCO frequency, which is set at the factory to 76kHz.

The left and right audio output signals then go through a 15kHz low pass filter which removes any remaining 19kHz and 38kHz signals.

The left channel then goes through U2, which is a fixed delay buffer amplifier. The right channel goes through a variable delay buffer amplifier, U4. Potentiometer R15 is the variable delay and is used to adjust signal phase. It is used to maximize the stero decoders stereo separation and compensate for any delays that might be encountered.

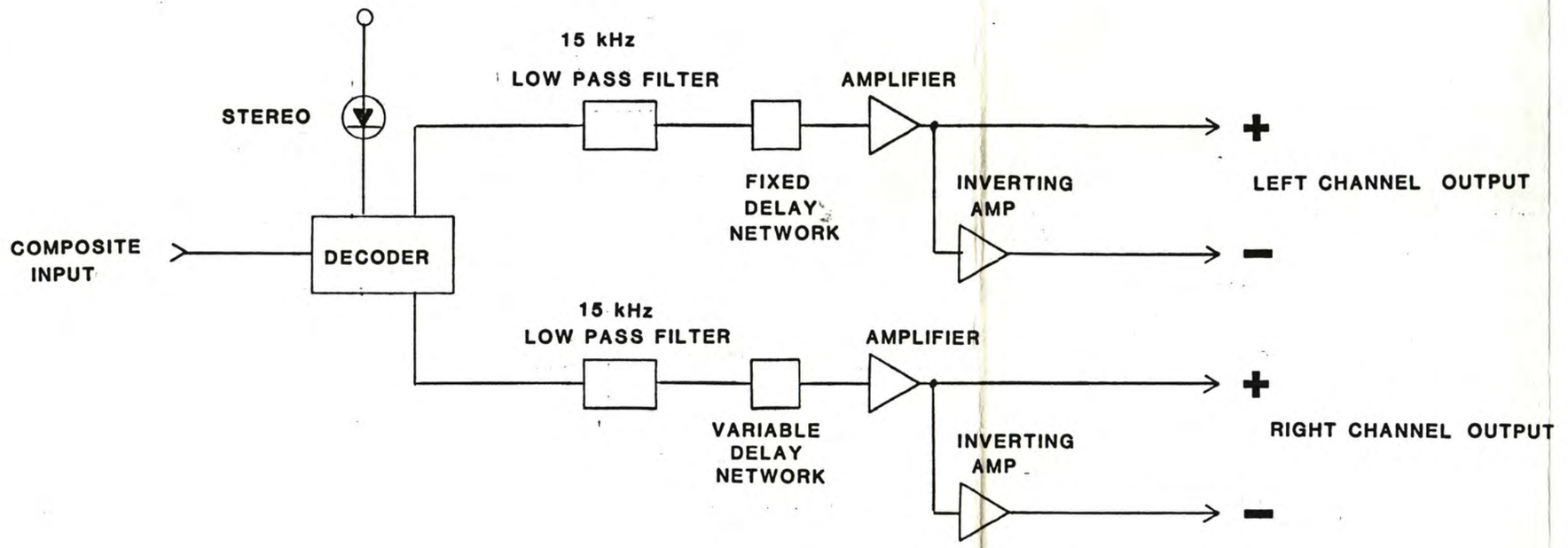
The left channel then goes into U3, which $^1/_2$ is used for a non-inverting output and the other $^1/_2$ is used for an inverting output. The level of both inverting and non-inverting amplifiers is controlled by R28 which controls gain. The right channel operates in the same manner using U5. R24 is the right channel's output level adjustment potentiometer.

The left channel "+" output is J8 pin 7, the "-" is pin 8. The right channel "+" output is J8 pin 10, and the "-" is pin 9. In the 7707 the stereo board connector is J9.

Located on the P.C. Board is a light emitting diode, CR1. This L.E.D. indicates the reception of a 19kHz tone and turns on when a stereo signal is being received.

DWG. NO.	SH	REV.

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	PROD. RELEASE		



	QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	

PARTS LIST

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN	
CHECKED	
ISSUED	

TIME & FREQUENCY TECHNOLOGY INC.

BLOCK DIAGRAM STEREO DECODER

SIZE	FSCM NO.	DWG. NO.	REV.
B		6600-2288	A

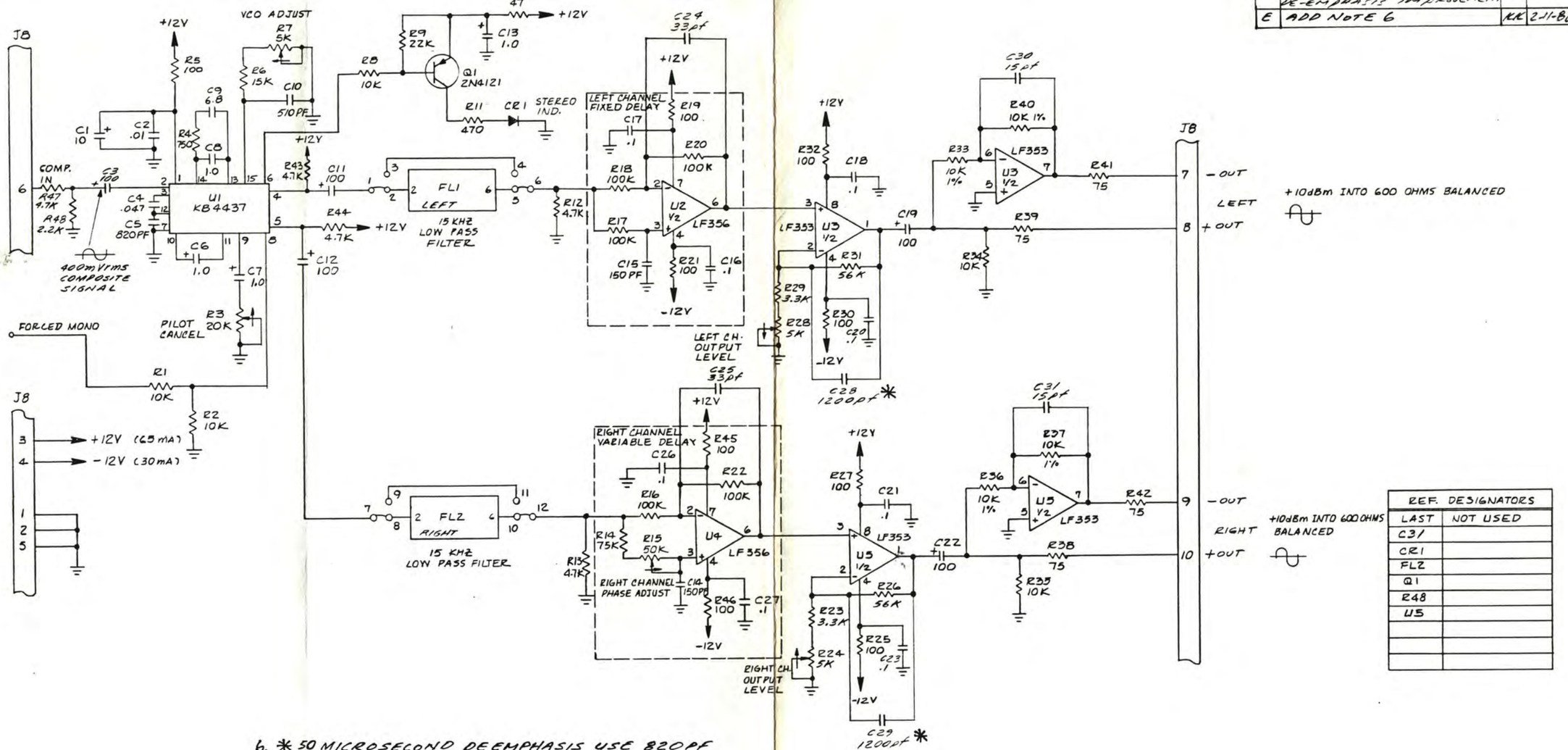
SCALE | SHEET

FIGURE F1

DWG. NO. 6601-3370	SH 1	REV.

REVISIONS

REV	DESCRIPTION	DR	DATE	APPD
A	PILOT RELEASE		5-27-83	
B	PROD. RELEASE		10-20-83	
C	REVISED PER ECO 1693	KK	6-21-84	
D	CAPS C24,C25 WAS .033MF P/N WAS 1015-0009 ADDED CAPS C28,C29 P/N 1001-0122, C30, C31 P/N 1001-0150 CHANGES MADE ABOVE FOR DE-EMPHASIS IMPROVEMENT			
E	ADD NOTE 6	KK	2-11-88	



REF. DESIGNATORS	
LAST	NOT USED
C31	
CR1	
FL2	
Q1	
R48	
U5	

6. * 50 MICROSECOND DEEMPHASIS USE 820PF
5. ⬭ = AC VOLTAGE TYPICAL VOLTAGES FOR 1mVRF INPUT
4. ▭ = DC VOLTAGE
3. ALL DC MEASUREMENTS MADE WITH NO RF INPUT
2. CAPACITOR VALUES ARE IN MICROFARADS
1. RESISTOR VALUES ARE IN OHMS, ¼W, 5%

NOTES: UNLESS OTHERWISE SPECIFIED

8301 (OPTION)	6608-3370
MODEL	NEXT ASSY
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ±
DECIMAL =
2 PLACE ±
3 PLACE ±
BREAK = .010MIN
SURFACE ROUGHNESS = MICROINCHES RMS MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = MAX
THREADS = CLASS 2 MARK IN ACCORDANCE WITH TFT SPEC 5300-1056

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION
		MATERIAL	
		FINISH	

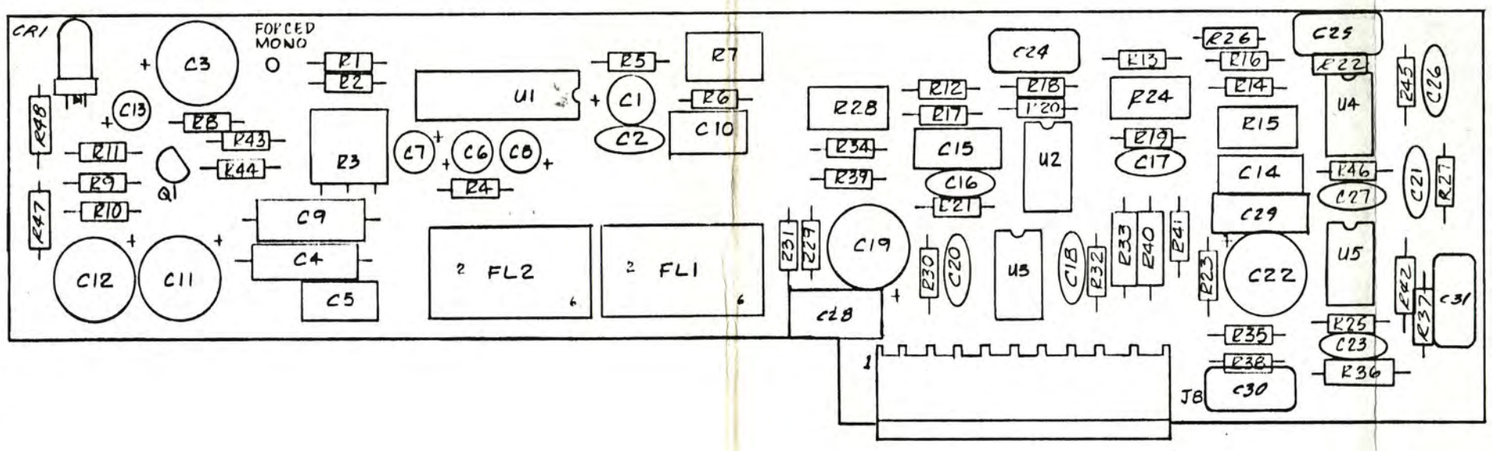
TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584

SCHEMATIC- STEREO DECODER

DR. BY	L. Auchie	5-27-83
CK. BY		
ENGR.		7/16/84
MFG.		7/16/84
Q.A.		7/16/84

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	D	6601-3370	E
SCALE —	DO NOT SCALE PRINT	SHEET 1 OF 1	

REVISIONS				
REV	DESCRIPTION	DR	DATE	APPD
A	PILOT RELEASE		5-27-83	
B	PROD. RELEASE			
C	REVISED PER ECO 1693	RR	4-21-84	
D	CAPS. C26 C25 WAS .033MF P/N1 WAS 1015-0004 ADDED CAPS C28, C29 P/N 1001-0122, C30, C31 P/N 1001-0150	RR	6-30-86	



3. FOR PCB SEE 1600-3370 (LATEST REV)
2. FOR SCHEMATIC SEE 6601-3370 (LATEST REV.)
1. FOR MATL LIST SEE 6608-3370 (LATEST REV)

NOTES: UNLESS OTHERWISE SPECIFIED

B301 (OPTION)	7100-3710
MODEL	NEXT ASSY
APPLICATION	

SPECIFICATIONS UNLESS OTHERWISE NOTED:
ANGULAR = ±___
DECIMAL =
2 PLACE ±___
3 PLACE ±___
BREAK = .010MIN
SURFACE ROUGHNESS = ___ MICROINCHES RMS: MAX.
DIAMETERS = CONCENTRIC WITHIN .005 TIR.
FILLET RADIUS = ___ MAX
THREADS = CLASS 2 MARK IN ACCORDANCE WITH TFT SPEC 5300-1058

ITEM	QTY	PART NO.	NOMENCLATURE OR DESCRIPTION

MATERIAL
FINISH

DR. BY	L. Ruchie	5-27-83
CK. BY		
ENGR.		5/27/83
MFG.		7/9/84
Q.A.		7/16/84

TFT INC 3090 OAKMEAD VILLAGE DR. SANTA CLARA, CA. 95051 (408) 727-7272 TWX 910-338-0584

PCB ASSEMBLY- STEREO DECODER

CODE IDENT NO.	SIZE	DRAWING NO.	REV.
	C	6608-3370	D
SCALE 2/1	DO NOT SCALE PRINT	SHEET 1 OF 1	

Model 8301 (Option) STEREO DECODER Assembly #6608-3370 Rev. D

CKT REF	DESCRIPTION	QTY	TFT STOCK NO.
C1	Cap Elect 10 MF 25V	1	1010-0099
C2	Cap Cer Disc .01 MF	1	1005-1039
C3	Cap Elect 100 MF 25V	5	1010-0110
C4	Cap Poly Carb .047 MF 50V	1	1006-0470
C5	Cap Mica 820 PF	1	1001-0821
C6	Cap Elect 1.0 MF 50V	4	1010-0009
C7	Cap Elect 1.0 MF 50V		1010-0009
C8	Cap Elect 1.0 MF 50V		1010-0009
C9	Cap Tan 6.8 MF 35V	1	1008-0068
C10	Cap Mica 510 PF	1	1001-0511
C11	Cap Elect 100 MF 25V		1010-0110
C12	Cap Elect 100 MF 25V		1010-0110
C13	Cap Elect 1.0 MF 50V		1010-0009
C14	Cap Mica 150 PF	2	1001-0151
C15	Cap Mica 150 PF		1001-0151
C16	Cap Cer Disc .1 MF 25V	8	1005-0100
C17	Cap Cer Disc .1 MF 25V		1005-0100
C18	Cap Cer Disc .1 MF 25V		1005-0100
C19	Cap Elect 100 MF 25V		1010-0110
C20	Cap Cer Disc .1 MF 25V		1005-0100
C21	Cap Cer Disc .1 MF 25V		1005-0100
C22	Cap Elect 100 MF 25V		1010-0110
C23	Car Cer Disc .1 MF 25V		1005-0100
C24	Cap Cer .033 MF CK05BK	2	1015-0004
C25	Cap Cer .033 MF CK05BK		1015-0004
C26	Cap Cer Disc .1 MF 25V		1005-0100
C27	Cap Cer Disc .1 MF 25V		1005-0100
CR1	LED HP 5082-4403 RED	1	1285-4403
FL1	LP Filter Audio 15 KHz Stereo L.P.	2	1052-0056
FL2	LP Filter Audio 15 KHz Stereo L.P.		1052-0056
J8	Socket Lock 10 Pin Molex	1	2250-5210
Q1	Trans 2N4121	1	1271-4121
R1	Res Car Comp ¼W 5% 10K	5	1065-1002
R2	Res Car Comp ¼W 5% 10K		1065-1002
R3	Res Var PC MT 20K 1T	1	1072-2002
R4	Res Car Comp ¼W 5% 750	1	1065-0750
R5	Res Car Comp ¼W 5% 100	9	1065-0100
R6	Res Car Comp ¼W 5% 15K	1	1065-1502
R7	Res Var PCMT 5K 1T	3	1072-5001
R8	Res Car Comp ¼W 5% 10K		1065-1002

Model 8301 (Option) STEREO DECODER Assembly #6608-3370 Rev. D

CKT REF	DESCRIPTION	QTY	TFT STOCK NO.
R9	Res Car Comp ¼W 5% 22K	1	1065-2202
R10	Res Car Comp ¼W 5% 47	1	1065-0047
R11	Res Car Comp ¼W 5% 470	1	1065-0470
R12	Res Car Comp ¼W 5% 4.7K	5	1065-4701
R13	Res Car Comp ¼W 5% 4.7K		1065-4701
R14	Res Car Comp ¼W 5% 75K	1	1065-7502
R15	Res Var PC MT 50K 1T	1	1072-5002
R16	Res Car Comp ¼W 5% 100K	7	1065-1003
R17	Res Car Comp ¼W 5% 100K		1065-1003
R18	Res Car Comp ¼W 5% 100K		1065-1003
R19	Res Car Comp ¼W 5% 100		1065-0100
R20	Res Car Comp ¼W 5% 100		1065-0100
R21	Res Car Comp ¼W 5% 100K		1065-1003
R22	Res Car Comp ¼W 5% 100K		1065-1003
R23	Res Car Comp ¼W 5% 3.3K	2	1065- 3301
R24	Res Var PC MT 5K 1T	2	1072- 5001
R25	Res Car Comp ¼W 5% 100		1065-0100
R26	Res Car Comp ¼W 5% 100K		1065- 1003
R27	Res Car Comp ¼W 5% 100		1065-0100
R28	Res Var PC MT 5K 1T		1072- 5001
R29	Res Car Comp ¼W 5% 3.3K		1065- 3301
R30	Res Car Comp ¼W 5% 100		1065-0100
R31	Res Car Comp ¼W 5% 100K		1065- 1003
R32	Res Car Comp ¼W 5% 100		1065-0100
R33	Res MT Film 1/8W 1% 10K	4	1061-1002
R34	Res Car Comp ¼W 5% 10K		1065-1002
R35	Res Car Comp ¼W 5% 10K		1065-1002
R36	Res MT Film 1/8W 1% 10K		1061-1002
R37	Res MT Film 1/8W 1% 10K		1061-1002
R38	Res Car Comp ¼W 5% 75	4	1065-0075
R39	Res Car Comp ¼W 5% 75		1065-0075
R40	Res MT Film 1/8W 1% 10K		1061-1002
R41	Res Car Comp ¼W 5% 75		1065-0075
R42	Res Car Comp ¼W 5% 75		1065-0075
R43	Res Car Comp ¼W 5% 4.7K		1065-4701
R44	Res Car Comp ¼W 5% 4.7K		1065-4701
R45	Res Car Comp ¼W 5% 100		1065-0100
R46	Res Car Comp ¼W 5% 100		1065-0100
R47	Res Car Comp ¼W 5% 4.7K		1065-4701
R48	Res Car Comp ¼W 5% 2.2K	1	1065-2201
U1	IC KB4437	1	1100-4437
U2	IC LF356	2	1100-0356
U3	IC LF353	2	1100-0353
U4	IC LF356		1100-0356
U5	IC LF353		1100-0353

Model 8301 (Option) STEREO DECODER Assembly #6608-3370 Rev. D

CKT REF	DESCRIPTION	QTY	TFT STOCK NO.
	SOCKET IC 8 Pin	4	2250-1008
	SOCKET IC 16 Pin	1	2250-1016
	Solid Pin	13	2140-0071
	PCB	1	1600-3370