INSTRUCTION MANUAL

FOR

MX170C NAV / COMM TRANSCEIVER

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I. INTRODUCTION

This manual contains information on the Michel MX170(C), manufactured by TKM, Inc. The information includes installation, operation, mechanical and electrical descriptions and alignment and test considerations. The MX170(C) is authorized by the Federal Aviation Administration to TSO C34e, C36e, C37d, C38d, C40c and has met the test requirements of RTCA/DO-160C.

A. Purpose of Equipment

The equipment is a 760 channel communication (COMM) transceiver for use in aviation services and a 200 channel navigation (NAV) receiver to provide VOR / LOC signals to navigational converters. The NAV receiver also provides frequency selection for remote mounted Distance Measuring Equipment and Glide slope Receivers.

The MX170(C) is designed to be used as a direct replacement for the King KX170/ KX175. The unit is dimensionally identical to the King units and can therefore use existing aircraft installations. Except for improved performance characteristics, the unit is electrically interchangeable with the King units and will provide the proper audio, navigation and channeling signals for existing installations. New installations can be made using KX170A installation kits.

B. Equipment Description

The unit features digital (LED) displays for active (yellow) frequency channel and standby (red) frequency channel for both COMM and NAV.

For channel selection a MHz knob and a KHz knob are provided. For 25 KHz increments in COMM, a 25 KHz button is provided. To activate COMM or NAV frequency selection, an N-C button is provided, a tic appears in the selected standby channel display.

Channel selection operates on the standby channel only. When the desired channel is indicated in the standby display, it may be placed into the active position by depressing the ‘Flip-flop’ button located left of the displays. The active channel is then placed into the standby position.

The NAV receiver features a VC-ID button to permit selection of voice or ident reception. In the Ident condition a ‘tic’ is displayed on the active NAV channel display.

The COMM transceiver features a test button which overrides the squelch to verify proper receiver operation and to allow reception of weak signals. Also, provided on the active COMM display is a ‘tic’ to indicate transmitter power output.

Power switches are incorporated with the NAV and COMM volume controls. The COMM is the master power switch and the NAV provides power switching for remote navigation units.

The MX170(C) is comprised of eight replaceable subassemblies. Five of the subassemblies are contained in shielded modules in order to reduce radio frequency interference. The five are the NAV receiver, the NAV synthesizer, the COMM receiver, the COMM synthesizer, and the Transmitter.

The remaining three subassemblies are the Rear Panel Assembly, the Front Panel Assembly and the Computer Board. The Rear Panel Assembly contains the Audio Amplifier, Power Filter, and the T/R switching. The Front Panel Assembly contains the digital displays, the function select switches and the volume controls. The Computer Board contains the microprocessor, the memory, and program storage.

Also contained on the computer board are the audio processing circuits and the channeling circuits.

The subassemblies are interconnected with plugs so that any module may be replaced without the use of a soldering iron. For equipment repair it is recommended that complete subassemblies be replaced.

As an aid to locating the defective subassembly a set of analog test points are provided. The analog test points include the receiver tuning voltages, synthesizer control voltages, and the AGC lines.

C. Specifications

MX170(C) TRANSCEIVER

Mounting:	Panel mounted, no shock mounting required.
Size:	6.312 x 2.600 x 14.15 inches w/ connectors (16.03 x 6.60 x 35.94 cm)
Weight:	4.9 lbs excluding external connector and harness.
Power Requirements:	13.75 Vdc (or v w/CONV)
NAV and COMM Recv'r	1.7A
Max COMM Total w/ Transmit (Tone)	7.1A (6.2A unmodulated)

COMM Transceiver

Crystal Controlled:	760 channel
Frequency Range:	118.00 to 136.975 MHz
Frequency Stability:	+ .003%. –20 to 50C

Transmitter

VHF Power Output:	8 watts minimum, 50 ohm
Modulation:	85% capability with 90% limiting provided.
Microphone:	Dynamic mike containing transistorized pre-amp or carbon (must provide at least 120 m Vrms into 500 ohm load.
Sidetone:	Adjustable up to 40 mw into 500 ohm headphones.
Duty Cycle:	1 minute on, 4 minutes off (20%)

Receiver

Sensitivity:	1.5 uv (soft) will provide a 6 db minimum signal plus noise to noise ratio (KHz, 30% mod).
Selectivity:	Typical 6 db at +/-7.5 KHz, 60 db at +/- 17.5 KHz,
Spurious Responses:	Down at least 70 db.
Squelch:	Noise adaptive squelch with override.
AGC Characteristics:	From 2 to 100.000 uV audio output will not vary more than 1 db.

NAV Receiver

Crystal Controlled:	200 Channels
Frequency Range:	108.00 to 117.95 MHz
Sensitivity:	1.5 uv (soft) will provide a half-flag indication.
Selectivity:	Typical 6 db at +/- 15 KHz 60 db at +/- 35 KHz,
Spurious Responses:	Down at least 70 db.
Ident Filter:	15 db minimum
AGC Characteristics:	From 26 to 100.000 uV audio output will not vary more than 1 db
NAV Receiver Accuracy:	Two sigma limit, +/- 1 degree
NAV Output:	With LOC adjusted for 0.35 Vrms VOR = 0.5 Vrms (typical) into 20K ohms or greater load impedance.

Audio

Auxiliary Audio Inputs:	Three (3) 500 ohms with 30 db isolation between any two.
Frequency Responses:	Within 6 db from 350 Hz to 2500 Hz
Headphone Output:	40 mw into 500 ohm
Speaker Output:	4.5 Vrms into auxiliary input produces 5 watts audio output.

DME Channeling

	M0	M1	M2	M3		K0	K1	K2	K3		50 KHz
108	-	-	0	-	.0X	0	0	-	-	.X0	-
109	-	-	-	0	.1X	0	0	0	-	.X5	0
110	0	-	-	-	.2X	0	0	0	0		
111	0	0	-	-	.3X	-	0	0	0		
112	0	0	0	-	.4X	-	-	0	0		
113	-	0	0	0	.5X	0	-	-	0		
114	0	-	0	0	.6X	-	0	-	-		
115	-	0	-	0	.7X	-	-	0	-		
116	0	-	0	-	.8X	-	-	-	0		
117	0	0	-	0	.9X	0	-	-	-		

NOTE: (-) = OPEN, (0) = GROUND

ILS Energize: OPEN for VOR, GROUND for ILS

	GS 108	GS 109	GS 110	GS 111		GS 0.1	GS 0.3	GS 0.5	GS 0.7	GS 0.9
108	0	-	-	-	.0X	-	-	-	-	-
109	-	0	-	-	.1X	1	-	-	-	-
110	-	-	0	-	.2X	-	-	-	-	-
111	-	-	-	0	.3X	-	1	-	-	-
112	-	-	-	-	.4X	-	-	-	-	-
113	-	-	-	-	.5X	-	-	1	-	-
114	-	-	-	-	.6X	-	-	-	-	-
115	-	-	-	-	.7X	-	-	-	1	-
116	-	-	-	-	.8X	-	-	-	-	-
117	-	-	-	-	.9X	-	-	-	-	1

NOTE: (-) = OPEN, (0) = GROUND, (1) = CONNECTED TO G / S Switching Line

II. OPERATING THE MX170(B/C)

Operating controls for the MX170(C) are located on the unit front panel or through three access points in the case (See Figure 2)

The unit front panel is shown in Figure 1. The left-hand COMM (yellow) readout indicates the active COMM frequency and the right hand COMM (red) readout indicates the standby COMM frequency. The left-hand NAV (yellow) readout indicates the active NAV frequency and the right hand NAV (red) readout indicates the standby NAV frequency. A 'tic' readout is provided on the upper left-hand corner of the first digit of each of the four frequency readouts.

The active COMM 'tic' indicates the presence of transmitter power.

The standby COMM 'tic' indicates that the Frequency Selection knobs will control COMM standby frequency.

The active NAV 'tic' indicates that the NAV receiver is in the Ident Mode.

The standby NAV 'tic' indicates that the Frequency Selector knobs will control NAV standby frequency.

Power Application. The COMM volume control contains the master power switch and activates the COMM functions. The NAV volume control contains a power switch for the remote NAV units. In order to activate all COMM and NAV functions, both volume controls must be turned on.

Frequency Selection. The N/C button is used to activate either the COMM or the NAV frequency selection as indicated by the appropriate 'tic' display. The MHz and KHz controls can then be used to select a desired standby channel. In COMM the '25' button is used to advance the frequency by 25 KHz.

After the desired standby frequency is selected, it may be transferred to the active position by pressing the desired 'flip-flop' buttons left of the displays. The active and standby channels will be transposed each time the button is pressed.

Ident/Voice Selection. The VC-ID button can be used to select a tone filter in order to receive voice signals on the NAV receiver. The switch is also used for frequency storage as described in Frequency Storage.

Test. The TEST button is a dual function switch. In normal operation, it is used to override the squelch to verify receiver operation and to receive weak signals. The switch is also used for frequency storage as described below.

Transmit. The transmit mode on the transceiver is selected by grounding the MIC Key line on the unit's rear panel.

Clearing all frequency presets. To clear the entire memory, both NAV and COMM, except for factory presets:
1. Turn radio off.
2. While holding down the TEST button, turn the radio on. The unit will reset to factory preset default channels in both active and standby (COMM 121.50/120.00) (NAV 108.00/112.00).

Frequency Storage. The MX170C NAV COMM allows up to 50 NAV and 50 COMM preset frequencies to be stored in the memory for recall. The use of memory presets is described in the following procedures.

Examining / Changing / Inserting / Deleting frequency presets. These operations on individual frequency presets are accomplished in EDIT mode. To enter EDIT mode, turn on the power to the radio while holding the VT button depressed. When the radio is in EDIT mode, the active displays show the sequential number of the preset (1,2,3,etc.) and the standby displays show the actual preset frequency.

EDIT mode operations can be performed on either the COMM or NAV preset list, according to where the tuning tic indicator is displayed. The tuning tic appears immediately to the left of the COMM or NAV standby displays. Pressing the N-C button toggles between NAV and COMM preset editing.

Examining presets (EDIT MODE). Pressing the COMM F-F button will step to the next frequency in the preset list. Pressing the TEST button will step to the previous frequency in the preset list. Pressing COMM F-F when the last preset is displayed will cause the first preset to display. Similarly, pressing TEST when the first preset is displayed will cause the last preset to display. Warning: When there is only one preset in the list, the radio will not appear to "do anything" when the COMM F-F or TEST is pressed. This is because the current, previous, and next presets are all the same preset.

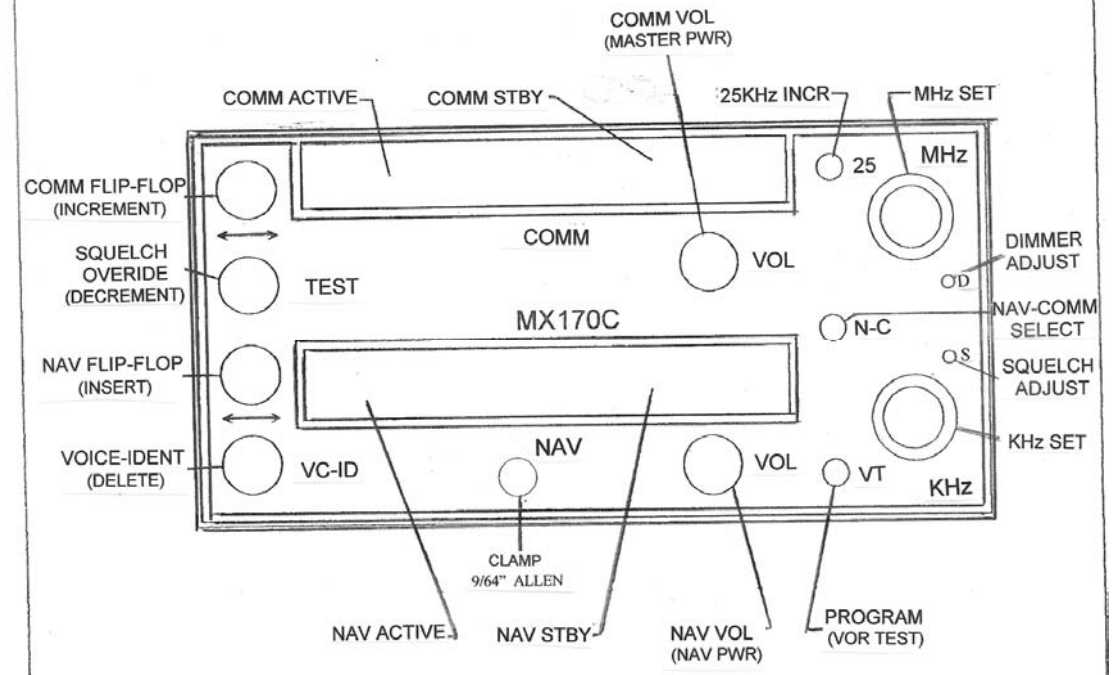
Changing a preset (EDIT MODE). Press COMM F-F or TEST until the preset to be changed is displayed. Dial in the new preset frequency using the tuning controls and press either COMM F-F or TEST.

Inserting (Adding) a preset (EDIT MODE). Press COMM F-F or TEST until the desired insert point is displayed (the new preset will be inserted AFTER this insert point). Dial in the desired frequency using the tuning controls and press NAV F-F. Remember that a preset list may contain a maximum of 50 entries. Inserting commands that would cause this limit to be exceeded are ignored.

Deleting a preset (EDIT MODE). Press COMM F-F or TEST until the preset to be deleted is displayed. Then press the VC – ID switch to delete. If the deleted preset was not at the end of the list, all the presets that followed it are renumbered. Each preset list (NAV and COMM) must always contain at least one entry. If there is only one entry remaining in a preset list, it may not be deleted (It can be changed to another frequency).

Frequency preset, normal operation. At any time the radio is in normal operation (Not EDIT MODE), COMM preset frequencies may be called into the standby frequency display by pressing COMM F-F while the TEST button is depressed. During the time that both buttons are held simultaneously depressed, the reference number for the preset appears in the active window. Each time this operation is repeated, it will copy the "next" preset to the COMM standby frequency.

NAV preset operation is similar, with the exception that presets are retrieved by pressing and holding the NAV F-F while pressing the VC – ID.



MX170(B/C) FRONT PANEL

Figure 1

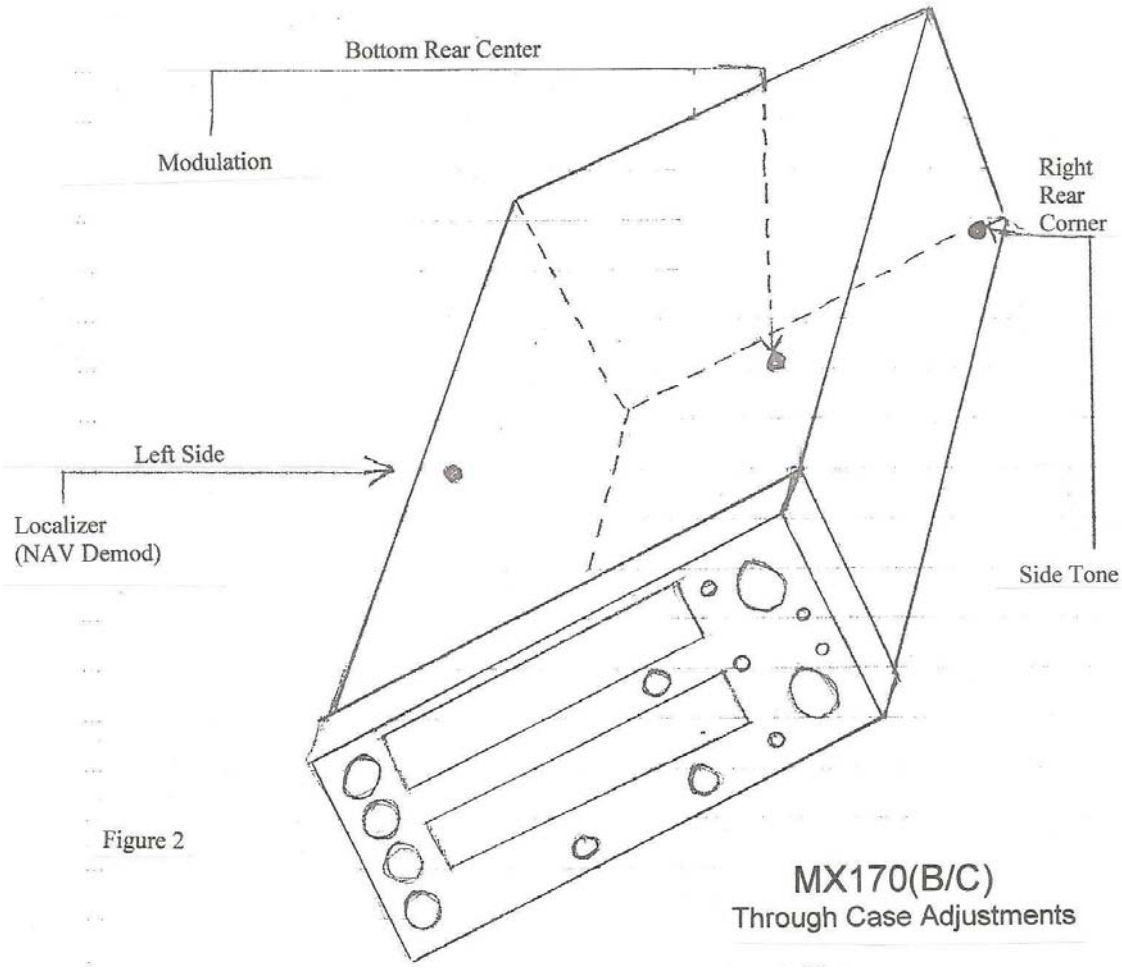

Bottom Rear Center
Modulation
Right
Rear
Corner
Left Side
Localizer
(NAV Demod)
Side Tone
MX170(B/C)
Through Case Adjustments

Figure 2

III. INSTALLATION

The MX170C is designed to be an exact replacement for the KING KX170A and similar units. As a replacement unit, the MX is inserted directly into the mounting tray for the KX170A and tightened down with an allen wrench (5/64).

For new installations, the installation instructions for the KX170A should be used.

Equipment removal is accomplished by rotating the clamp screw counterclockwise a few turns until it can be felt that the clamp screw is disengaged. Excessive torque on the clamp screw will result disassembly of the clamp. After the clamp has been disengaged the unit may be extracted by rocking the unit from side to side. The knobs should not be used as extraction handles. A King Extraction tool # 071-6045-00 is also an acceptable extraction device. Another method for extraction of a tight unit would be to rotate the clamp screw counterclockwise until significant resistance is noted, the clamp screw can then be pulled forward to expose the screw head. Grasp the screw head with a suitable device and extraction force can be applied. Excessive side to side motion should not be applied to the clamp screw.

**** NOTICE TO INSTALLER ****

The TKM MX170C NAV/COMM is authorized by the FAA to TSO C34e, C36e, C37d, C38d, and C40c. The product is an incomplete system. In order to achieve a complete TSO quality system, the MX170C **must** be installed to configure in conjunction with a TSO C37/C38 authorized antenna and a TSO C34e authorized navigation receiver. It is the responsibility of the installer to ensure proper installation.

****CONTINUED AIRWORTHINESS (HBA 98-18)****

Permission is hereby given to installers approved by the recognized aviation authority to reference excerpts from the installation instructions provided by TKM Inc. in order to fulfill documentation requirements for Instructions for Continued Airworthiness (ICA). Adequacy of the documents should not be assumed by this permission. ICA documentation rests solely with the ICA applicant. The MX170C product is 'Repair on Condition Only'.

MX170(B/C) INTERCONNECT

The following table lists the pin description for the MX170C external interconnect:

Pin #	Description	Pin #	Description
1	NAV A +	22	DME M0
2	GS +	23	DME M1
3	VOR/LOC Signal	24	DME M2
4	ILS ENABLE	25	DME M3
5	50 KHz GS	26	NAV A+ Switched
6	0.1 MHz GS	27	DME K0
7	0.3 MHz GS	28	DME K1
8	0.5 MHz GS	29	DME K2
9	0.7 MHz GS	30	DME K3
10	0.9 MHz GS	31	DME 50 KHz
11	108 MHz GS	32	DME Common
12	109 MHz GS	33	VOR Test
13	110 MHz GS	34	Phones, Comm
14	111 MHz GS	35	NAV Audio
15	Aux Audio –1	36	Aux Audio -1
16	Aux Audio –4	37	ICS
17	A / C Power Switched	38	Not Used
18	13.5 vdc Input	39	Mic Audio
19	Ground	40	Mic Key
20	A / C Power	41	Speaker
21	Power/Speaker Ground	42	COMM FLIP-FLOP*

- Requires addition of internal resistor R53 on computer board.

IV. PRINCIPLES OF OPERATION

For ease of service the MX170(B/C) has been designed into 8 replaceable modules. The modules are:

A. Front Panel Assembly
B. Rear Panel Assembly
C. Computer Board
D. NAV Receiver
E. COMM Receiver
F. NAV Synthesizer
G. COMM Synthesizer
H. Transmitter

A. Front Panel Assembly-Dwg. SS1740
The front panel includes the four frequency displays, a photocell for automatic brightness control, 7 push buttons, two volume controls with proper switches and two frequency selecting switches. The displays and controls are connected to the display driver board through pin and socket connectors and to the computer board with a ribbon cable.

B. Rear Panel Assembly-Dwg. SS1750
The rear panel includes the power converter, the audio circuits and T/R switching circuits. Refer to Dwg. SS1750.

IIA is both the audio preamplifier and summing point for all audio inputs except the microphone input. IIB is the second audio amplifier. The input to this amplifier is selected between the first audio and the microphone input with 12A or 12B. 12C is used as an inverter to activate 12A. The selected audio is volume comprised in I3 and applied to the push-pull audio output of IC's 14 and 15. Q1, Q2, and K1 provide switching to couple the audio amplifier to the speaker for receiving operations or the transmitter for transmit operation.

The power supply consists of an input filter L1, C29, and C30, a +5 volt regulator and a voltage converter. The +5 volt regulator is designed around a 3524 pulse width modulator with a crowbar protection circuit. Q3 is the power switch in the circuit. Q4 and Q5 with T1 form the converter circuit and provide a 20 volt p-p square wave for the output rectifiers. I8 provides a regulated +15 vdc output and D9 and D10 provide an unregulated –20 vdc output.

The T/R switch, Dwg. SS1731 contains switching diodes D1 and D2 and a low pass filter L1, C1, L2, C4. In receive, the diode is forward biased to couple the receiver to the antenna. In transmit, the T/R line is open circuited to permit the transmitter signal to generate a reverse bias on the diode to the peak value of the transmitter signal.

C. Computer Board-Dwg. SS1760
The computer board contains 3 basic sections:

1. Computer
2. Analog Processing
3. Channeling Circuits

1. Computer
The computer is comprised of the processor (I6), the Program Prom (I5), the Memory Ram (I4), the address decoder (I7), the oscillator (I3), and the read/write decoder (I8). The RAM contains a lithium battery that will support the memory indefinitely.

2. Analog Processing
The Analog Processing functions include noise detection, phone amplification, tracking, squelch, Ident code filtering and transmitter monitoring.

I12 B is an adjustable gain amplifier used to track receiver tuning to synthesizer frequency. I12A and I12 D is a 2 pole band pass filter to separate noise from audio signals. The noise is detected with D4; the noise level is used to inhibit the carrier squelch threshold as determined by I13 B.

I13A detects the voltage on the T/R switch. When a large negative voltage is detected, an active signal is applied to I1 to turn on the transmit "Tic".

3. Channeling Circuits
The channeling circuits are comprised of digital latches and output drivers. I16 provides the Slip code channeling for the DME, I15 provides Glide Slope KHz output drive, and I14, 17 provide Glide Slope MHz output drive in addition to the ILS enable drive.

D, E. NAV(Dwg. SS18677 and COMM(Dwg. SS1866) Receivers
The NAV and COMM receivers are functionally the same. The only difference between the two receivers is the RF tuning, the AGC time constant and a tuning voltage sensor in the COMM receiver which reduces the receiver gain during Transmitter actuation.

D1, 2, 3 and 4 provide RF tuning and are tracked to the appropriate Frequency Synthesizer using circuitry on the computer board.

Q1 is the RF amplifier, D8 is a diode quad used as a balanced mixer, Q2 is the first IF amp, I1 is the second IF amp, and D5 is the detector.

I2 A is the first agc amp and I2 D is the second agc amp. I2 B and I2 C are audio amplifiers.

The crystal filter is a single assembly containing 8-poles.

D7, with associated components, provides dynamic noise limiting.

F, G. NAV(Dwg. SS2714) and COMM(Dwg. SS2716) Synthesizers
The NAV and COMM synthesizers are identical except for tuning and an additional output is provided in the COMM synthesizer to drive the transmitter.

I3 receives digital frequency information from the computer and sets the internal frequency divide ratios to determine the desired output frequency. I3 also contains a phase detector to generate an error signal for the voltage-controlled oscillator (VCO) I2. I1 is used to amplify and filter the error signal for the VCO.

Q4 is a buffer amplifier which isolates the VCO from the divider circuits. I4 is a high frequency divider which is used in conjunction with and controlled by I3.

Q1, Q2, and Q3 are buffer amplifiers which provide the proper output levels and isolation from the VCO.

Q5 is a T/R switch which provides power switching for Q3 as well as the first amplifier transistor in the transmitter.

H. Transmitter(Dwg. SS1881)
The transmitter consists of 4 RF power amplifiers. The first amplifier Q4 is gated by power received from the frequency synthesizer. Q1, Q2, and Q3 form a broadband collector modulated transmitter chain.

V. Mechanical Disassembly

The first step in mechanical disassembly is to remove the top cover by removing the nine screws around the sides and rear of the cover. The cover may then be pried up at either rear corner, lifted slightly and slid away from the front panel.

The Computer Board is removed by removing the connectors and then the six spacers holding the Computer board. The board may then be lifted from the unit.

The Front Panel may be removed by removing four screws from the sides and bottom.

The Rear Panel is removed by removing two screws on the bottom of the unit and one screw from each side of the unit. The Transmitter power lead can be removed by loosening the attaching screw.

The R-F modules may be removed by removing the mounting screws.

VI. Alignment and Test Specifications

Adjustments are made on the total unit on a final test basis and on an installation basis.

Installation adjustments are accessible without removing the cover and include a side tone level adjustment, a microphone gain adjustment, and an audio gain adjustment (See Figure 2).

Engineering Bulletin

August 18, 1992

Bulletin: #081792

Subject: Requirement for Spectrum Analyzer to repair TKM NAV / COMM Radios.

A spectrum analyzer is required only for alignment of the Frequency Synthesizer module. If Synthesizer repair is made on a replacement basis, it is not necessary to have a spectrum analyzer for field service.

Other adjustments for the MX170(B/C) which are not normally adjusted on installation but may require adjustment different from factory set levels include the squelch level, the dimmer and the NAV demod level.

Module Alignment

A. Front Panel Assembly

The front panel requires no alignment.

B. Rear Panel Assembly

The rear panel contains two potentiometers that are adjusted as follows:

1. Microphone Gain (R10). Apply .30 Vrms at 1000 Hz to pin 39 of P1. Adjust R10 so that 12 v p-p is output to the transmitter modulation line.
2. Sidetone Level (R33). Apply .30 Vrms at 1000 Hz to pin 39 of P1 and adjust R33 so that 1.0 vrms appears across a 500 ohm load connected to pin 34 of P1.

C. Computer Board

The computer board contains mostly system alignment adjustment which can be set only with a complete unit. The clock frequency, however, can be set on the board level.

1. To alter the clock frequency, adjust C2 so that frequency measured on pin 6 of U3 is 4,032,000 + 10 Hz at 70 degrees ambient temperature.

D. NAV Receiver

1. Apply +15 vdc and –30 vdc to appropriate input leads, local oscillator signal at 3.0 + 2 dbm and a 0 to 14 vdc variable voltage source to Vt.
2. IF Alignment (L2, L3, L4). Apply =7.0 vcd to Vt, 117.90 MHz at –90 dbm to RF in and 96.50 MHz at +3 dbm to L. O. Adjust L2, L3 and L4 for minimum voltage reading on Vagc. Apply amplitude modulation of 30% and monitor DMD output.

3. As the modulation frequency is adjusted from 1.0 to 12.0 KHz the DMD level shall be constant +1 db. Adjust L2 and L3 as necessary to keep DMD level constant.
4. RF Alignment (T1, T2, L1, T3). With conditions the same as in IF Alignment, but modulation set to 0, adjust turn spacing on T1, T2, L1 and T3 so that Vagc reading is a minimum.
5. Change RF to 108.00 MHz and L.O. to 86.60 MHz. Adjust Vt for minimum Vagc.
6. DMD Level (R25). With conditions the same as in IF Alignment apply a standard centered LOC modulation and adjust R25 for .35 Vrms on DMD output.

E. COMM Receiver

1. Apply +15 vdc and –30 vdc to appropriate input leads, set local oscillator signal to 3 + 2 dbm and a 1 to 15 vdc variable voltage source to Vt.
2. IF Alignment (L2, L3, L4). Apply +10 vdc to Vt, 135.975 MHz at –90 dbm to RF and 157.175 MHz to L.O. Adjust L2, L3, and L4 for minimum voltage reading on Vagc. Apply amplitude modulation of 30% and frequency is adjusted from 1.0 to 12.0 KHz the DMD level shall be constant + 1 db. Adjust L2 and L3 as necessary to keep DMD level constant.
3. RF Alignment (T1, T2, L1, T3). With conditions the same as in IF Alignment but modulation set to 0, adjust turn spacing on T1, T2, L1, and T3 so that Vagc reading is a minimum.

F. NAV Synthesizer

1. Apply +15 vdc and 1 Mhz to appropriate module input. Set R3 to midrange. Digitally input, using Computer board or equivalent, the proper coding for 96.50 MHz. Verify correct output frequency. Adjust turn spacing on T1 so that Vt = 7.00 vdc. Digitally input coding for 86.60 MHz. Vt shall be 2.50 +.30 vdc.
2. Digitally input coding for 91.60 MHz and monitor output on a spectrum analyzer. Adjust R3 so that 50 KHz sidebands are nulled.

G. COMM Synthesizer

1. Apply +15 vdc and 1 MHz to appropriate module input. Set R3 to midrange. Digitally input, using Computer board or equivalent, the proper coding for 157.30 MHz. Verify correct output frequency. Adjust turn spacing on T1 so that Vt = 10.00 vdc. Digitally input coding for 139.40 MHz. Vt shall be 5.00 + .50 vdc.
2. Digitally input coding for 149.00 MHz and monitor output on a spectrum analyzer. Adjust R3 so that 25 KHz sidebands are nulled.

E. Transmitter

The transmitter does not normally require alignment but tests should be performed to verify proper operation.

1. Connect the transmitter to a properly aligned COMM Synthesizer and connect a 50 ohm load to the Transmitter output. Monitor the output power level to verify that it is at least 9.0 watts without modulation across the frequency range of 118 to 136 MHz. Apply at least 80% modulation at 1.0 KHz and monitor the output with a spectrum analyzer to verify that no parasitic oscillation is present. If problems are encountered, consult the factory.

2. Apply at least 80% modulation at 1.0 KHz and monitor the output with a spectrum analyzer to verify that no parasitic oscillation is present. If problems are encountered consult the factory.

System Alignment

When all modules are aligned and assembled into a system, it is necessary to make receiver tracking, VOR / LOC converter and squelch adjustments.

1. COMM receiver tracking is accomplished by selecting 118.00 MHz as the active channel, applying a 10 uV RF input signal at 118.00 MHz, and adjusting R47 on the Computer Board for minimum reading on COMM AGC line.
2. NAV Receiver tracking is accomplished by selecting 108.00 MHz and adjusting R33 on the Computer board for a minimum reading on NAV AGC.
3. Carrier squelch is adjusted by applying an unmodulated carrier at 3.0 uV to the COMM receiver and adjusting R18 on the Front Panel, to just break squelch.
4. Noise inhibit is adjusted by applying a carrier with 30% modulation at 6.666 KHz to the COMM receiver and adjusting R65 on the computer board so that a 12 uV signal will just break squelch.
5. Demod output level is set by R29 (Demod Level) on computer board.
   The 1020 Hz Filter is adjusted by monitoring the audio output and applying a 1020 Hz modulation to the NAV Receiver input. With “Voice” selected adjust R12 (1020 Hz) for minimum tone output.

TKM, INC.
14811 North 73RD Street
Scottsdale, AZ 85260

TA 0001-1	APPROVED:	DATE: April 10, 2004

Final Test Procedure for the following TKM Radios:
MX11, MX12, MX170B, MX170C, MX300, MX385

The following procedure shall be used to verify compliance of TKM radios to TSO approval requirements, and may be run concurrently with TA 0002.

1. Prior to any test verify that the radio is completely assembled except for the cover and nameplates.

2. Connect radio with appropriate cable to the 1505 interface assembly and 1500 Signal Generator. Connect the MC60 if the radio includes a Nav Rcv. Apply the proper A+ (13.7 vdc for all units except MX385. MX385 requires 27.5 vdc).

3. Set radio and generator for 118.0 MHz in COMM with –99 dbm rf level and 30% AM at 1 KHz. Adjust COMM tracking pot for minimum COMM agc voltage. Adjust the squelch pot so that audio just comes on. Set radio and generator for 136.9 MHz and apply –85 dbm rf level and 30% AM at 6666 Hz. Adjust the NOISE SQUELCH pot so that the audio just comes on. Repeat this complete step until both squelch levels are met.

4. Activate transmitter and apply 0.12 vrms @ 1 KHz to MIC input. Adjust microphone gain for 40 +/- 3% modulation. Verify that the frequency error is less than 3.5 KHz and that the power level is greater than 8 watts and supply current is less than 6 amps. Deactivate transmitter.

5. Apply a standard VOR signal at 108 MHz and –67 dbm and select the same channel on the radio. Adjust the IDENT filter pot so that the 1020 Hz tone is minimized when the Ident tone is deactivated. Set the DEMOD level pot to obtain the VOR signal levels as indicated on Final Test Report (FTR – 1).

6. Verify proper VOR operation on the MC60. Set the RF level to – 107 dbm and adjust the NAV tracking pot for a minimum on the NAV agc line. Verify proper VOR operation.

7. Apply a centered LOC signal at – 67 dbm and verify a centered LOC display. Apply a .094 dbm LOC signal and verify a 60% deviation (6 dots) on the MC60. Small adjustments of DEMOD level may be made to obtain 6 dots.

8. Initiate Final Test Route card for the production lot and place the entire production lot in the –20 C freezer for the required cold soak period.

9. After the cold soak period remove the radio from the freezer and immediately measure receiver sensitivity (NAV & COMM) transmitter power and frequency. If receiver sensitivity is greater than 3 db out of spec or transmitter power is less than 8 watts or if the transmitter frequency error is greater than 3.5 Khz a NON-CONFORMANCE tag shall be applied to the unit.

10. The production lot shall then be put into burn-in. The units shall be stacked and power applied for the required period. After the required period the measurements described in step 9 shall be repeated.

Corrective actions shall be made as required.

11. The units shall be operated at room temperature for at least 30 minutes and measurements as indicated in the Final Test Report (FTR – 1) shall be made. Discrepancies shall be noted on a non-conformance tag and corrective action shall be taken.

12. After a unit passes all tests a serial number shall be assigned and entered on the Final Test Route card. Nametags shall be applied and the cover shall be placed on the unit.

REVISION RECORD FOR AT0001

Rev#	Date	Description	By
NONE	3-4-2002	ORIGINAL ISSUE	WEL
-1	4-10-2004	ADDED MX170C	WEL

TKM, INC.
14811 North 73RD Street
Scottsdale, AZ 85260

TA 0002 -1	APPROVED:	DATE: April 10, 2004

PRETEST AND TEMPRATURE TEST Procedure for the following TKM Radios:
MX11, MX12, MX170B, MX170C, MX300, AND MX385

The following procedures shall be used to verify compliance of TKM radios to TSO approval requirements,

1. Prior to any test verify that the radio is completely assembled except for the cover and nameplates.

2. Connect radio with appropriate cable to the 1505 interface assembly and 1500 Signal Generator. Connect the MC60 if the radio includes a Nav Rec. Apply the proper A+ (13.7 vdc for all units except MX385. MX385 requires 27.5 vdc).

3. Set radio and generator for 118.0 MHz in COMM with –99 dbm rf level and 30% AM a 1 KHz. Adjust COMM tracking pot for minimum COMM agc voltage. Adjust the squelch pot so that audio just comes on. Set radio and generator for 136.9 MHz and apply –90 dbm rf level and 30% AM at 6666 Hz. Adjust the NOISE SQUELCH pot so that the audio just comes on. Repeat this complete step unit both squelch levels are met.

4. Activate transmitter and apply 0.12 vrms @ 1 KHz to MIC input. Adjust microphone gain for 40 +/- 3% modulation. Verify that the frequency error is less than 3.5 KHz and that the power level is greater than 8 watts and supply current is less than 6 amps. Deactivate transmitter.

5. Apply a standard VOR signal at 108 MHz and –67 dbm and select the same channel on the radio. Adjust the IDENT filter pot so that the 1020 Hz tone is minimized when the Ident tone is deactivated. Set the DEMOD level pot to obtain the VOR signal levels as indicated on Final Test Report (FTR-1).

6. Verify proper VOR operation on the MC60. Set the RF level to –107 dbm and adjust the NAV tracking pot for a minimum on the NAV agc line. Verify proper VOR operation.

7. Apply a standard LOC signal at 108.1 MHz and –67 dbm and verify a centered LOC display. Apply a .094 dbm LOC signal and verify a 60% deviation (6dots) on the MC60. Small adjustments of DEMOD level may be made to obtain 6 dots.

8. Initiate Final Test Route card for the production lot and place the entire production lot in the –20 C freezer for the required cold soak period.

9. After the cold soak period remove the radio from the freezer and immediately measure receiver sensitivity (NAV & COMM) transmitter power and frequency. If

receiver sensitivity is greater than 3 db out of spec or transmitter power is less than 8 watts or if the transmitter frequency error is greater than 3.5 KHz a NON-CONFORMANCE tag shall be applied to the unit.

10. The production lot shall then be put into burn-in. Power supplied to the units shall be 12V-14V for MX11, MX12, MX170(B/C), and MX300and 24V-28V for MX385. Units shall be placed in hot test for a minimum of 7 hours at a minimum of 65 degrees C. Upon completion of the test, measurements described in step 9 shall be repeated. Corrective actions shall be made as required.

REVISION RECORD FOR AT0002

Rev#	Date	Description	By
NONE	3-22-2001	ORIGINAL ISSUE	WKL
-1	4-10-2004	ADDED MX170C, CHANGED STEP 10 IN	WKL

TKM, INC.
14811 North 73RD Street
Scottsdale, AZ 85260

TSA001
Page 1 of 1

TRANSMITTER TEST PROCEDURE

1). Connect unit to + 9dbm R.F. source with a frequency range of 118 to 137 MHz.

2). Apply the appropriate voltage from chart below to the modulation line.

3). Monitor output power with a R.F. power meter.

4). Output power level shall be 8 watts minimum and modulation line current shall be 3.0 amps (max) across the full frequency ranges. Adjust L18 as required to meet the above limits.

Type of Radio	DC Voltage to Apply
MX11	11.75 VDC
MX12	11.75 VDC
MX170B	12.5 VDC
MX300	12.5 VDC
MX385	13.75 VDC

TKM, INC.
14811 North 73RD Street
Scottsdale, AZ 85260

TSA002
Page 1 of 1

TEST FOR DRIVERS AND DISPLAYS
MX12, MX1700, MX300, MX385
----FOR MX11 USE TSA007----

1) Turn on power and verify all display segments light up.

2) Verify operation of dimmer function.

3) Verify that COMM/NAV flip-flop buttons change displays from standby to active and back again.

4) Verify that VC/ID button functions in the appropriate segment.

5) Verify that 25KHz button cycles frequency through 0-2-5-7 in extreme right COMM standby segment.

6) Verify N/C button flips from NAV to COMM and back.

7) Verify ability of MHz and KHz switches to properly cycle.

8) Verify power switch function by turning power off, and display goes dark.

9) Initial back of PC Board and sign off Router Card.

Approved: [signature]
4/1/99

TKM, INC.
14811 North 73RD Street
Scottsdale, AZ 85260

SYNTHESIZER TEST PROCEDURE

Date: Nov 12, 1995

Connect Comm Synthesizer to an operating Nav Comm Assembly and monitor Receiver and transmitter outputs with RF Voltmeter. Monitor Tuning voltage with a DC Voltmeter and Transmitter output with a Sideband Monitoring system capable of measuring 25 KHz sideband signals.

1. Set Nav Comm Assembly to 136.95 MHz in Receive mode. Adjust tuning voltage with R8 to 10.0 vdc.

2. Verify a tuning voltage of about 6 vdc at 118.7 MHz.

3. Receiver RF output shall be 9.0 +/- 1 db.

4. Select transmit mode and Transmit RF output shall be 9.0 +/- 2 db.

5. Adjust R7 to null 25 KHz sidebands on the Transmitter output.

6. Initial and date board.

Connect NAV Synthesizer to NAV COMM Assembly and monitor tuning voltage and RF output.

1. Select channel frequency of 117.95 MHz and adjust turn spacing on synthesizer for 7.0 vdc on tuning line.

2. RF output shall be 9.0 +/- 1 db.

3. Initial and date board.

Approved: [signature]
4/1/99

TKM, INC.
14811 North 73RD Street
Scottsdale, AZ 85260

REAR PANEL TEST PROCEDURE

Date: JAN 8, 1995

Connect Rear Panel with appropriate Cable to the REAR PANEL TEST SET. Apply appropriate A+ Voltage.

1. Monitor DC Voltages: +5 shall be 5.30 +/- .15 vdc.
   +15 shall be 15.0 +/- .3 vdc.
   -20 shall be -19.2 +/- .8 vdc. A/R

2. T/R Voltage in receive mode shall be:
   7.60 +/- .30 vdc for the MX300 and MX170B
   14.5 +/- .40 vdc for the MX385 and MX12

3, T/R Voltage in transmit mode shall be:
   -19.2 +/- .7 vdc. OR 0

4. With 4.0 Vrms at 1000 Hz applied to Test Set AUDIO INPUT adjust the microphone gain on the REAR PANEL to 15 vp-p while monitoring the transmitter A+ pin. On the MX12 the dc voltage shall be 11.8 +/- .5 and on the MX385 the dc voltage shall be 13.7 +/- .4.

5. With 4.0 vrms applied to Test Set AUDIO INPUT monitor he speaker output. On the MX300 adjust the speaker output to 22 vp-p with the audio gain control. On the MX385 adjust the level to 3.0 vp-p with the audio gain control. On the MX12 the speaker level shall be 20 +/- 3 vp-p. On the MX170 reduce the input level to .40 vrms and the speaker level shall be 18.0 +/2.0 vp-p.

6. Initial and date the unit.

Approved: [signature]
1/1/95

TKM, INC.
14811 North 73RD Street
Scottsdale, AZ 85260

RECEIVER TEST PROCEDURE

Date: SEPT. 21, 1996

Connect a Synthesizer and Receiver combination to a NAV COMM assembly.

COMM Receiver

1. Using a Spectrum Analyzer with a tracking generator align RF filters to have a symetrical response centered at 136.9 MHz when NAV COMM unit is tuned to 136.9 MHz. Peak gain shall be 15 +/- 1.5 DB. when output is measured at mixer input.

2. Apply -99 dbm at 136.9 MHz with 30% modulation. Peak the IF coil and adjust the AGC pot for 6.0 volts on the AGC line. Adjust the Audio gain pot for 4.0 vp-p on Audio Output.

NAV Receiver

1. Use the COMM Receiver procedure except use 117.9 MHz for the test channel.

Approved: [signature]
4/1/99

TKM, INC.
14811 North 73RD Street
Scottsdale, AZ 85260

TSA006-1
Page 1 of 1

TEST PROCEDURE FOR COMPUTER BOARDS
(MX12, MX170(), MX300, MX385)

1) Hook up the computer board to the rear panel and the front panel, then attach the COMM Synthesizer to the appropriate plug. Put the power supply to 13V-15V.

   NOTE: For an MX385, set the power supply to 27V-29V. Test the MX12 at both the higher and lower voltages.

2) Turn the power on, make sure the display lights up and the current goes to .5A +/-.2A

3) Set multi-meter to volts, hook ground lead to ground on rear panel. Take the positive lead and check out the voltage on the COMM Synthesizers.

   (a) Place the lead on pin 14 of the COMM and make sure the voltage cycles from 6V to 8V as you push the COMM flip-flop switch on the front panel.

   NOTE: Voltage level will be determined by what you have the Active NAV/COMM set at (the higher the frequency, the higher the voltage, the lower the frequency, the lower the lower the voltage.

4) Initial the board to indicate that the board has been tested, and by whom.

Approved: [signature] 11-19-2001

REVISION RECORD FOR AT0006

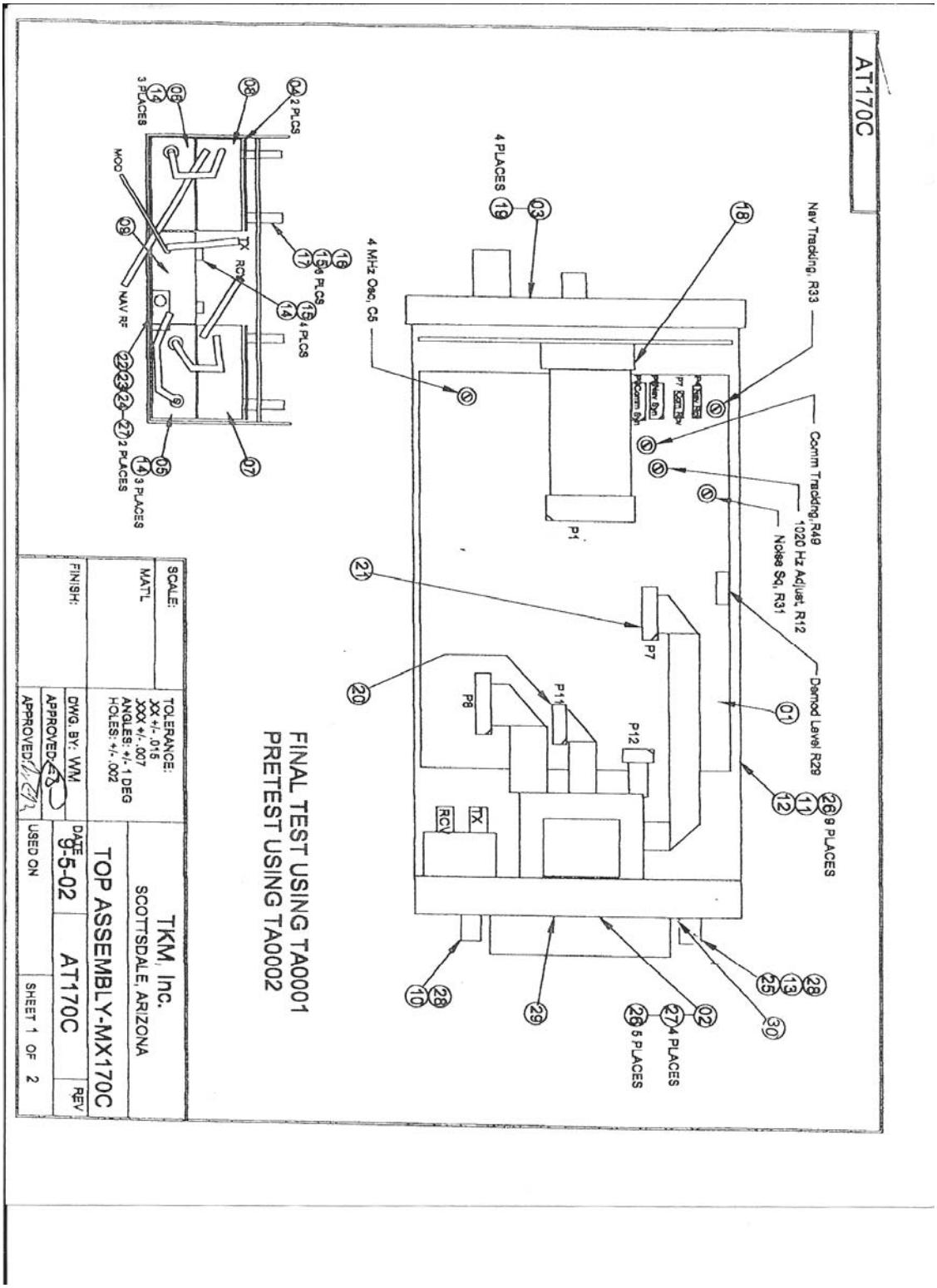
Rev#	Date	Description	By
-	NONE 4-1-1999	INITIAL ISSUE	MEH
-1	12-15-2005	EDITED FOR CLARITY-NO TECHNICAL CHANGE	[signature]

SCHEMATICS, LAYOUTS, AND PARTS LISTS

INDENTURED DRAWING LIST
MODEL MX170C

AT170C	REV NONE	MX170C TOP ASSEMBLY
SM1756	REV 3	COVER; MX170C
SM1757	REV 2	CASE; MX170C
HM1730	REV 1	COAX MTG BLOCK; MX170C
HM1757	REV 4	CLAMP; MX170C
HM1758	REV 2	MTG CLAMP BLOCK; MX170C
MP1740	NONE	NAMEPLATE, TSO; MX170C
MP1806	REV 2	NAMEPLATE, FCC; MX170C
SS1760	REV 9	COMPUTER ASSY; MX170C
PC1760	REV 9	PCB, COMPUTER; MX170C
LF1752	NONE	CHOKE, FILTER
SS1750	REV 9	REAR PANEL; MX170C
PC1750	REV 9	PCB, REAR PANEL; MX170C
HM1759	NONE	HEAT SINK, LONG; MX170C
HM1755	NONE	HEAT SINK, SHORT; MX170C
SM1755	REV 1	REAR PANEL; MX170C
LF1701	REV 1	TRANSFORMER INVERTER
LF1722	NONE	CHOKE, FILTER, 6 AMP
RN0001	NONE	RESISTOR, METAL FILM
TP1801	REV 1	TRANSFORMER INVERTER, 20V
TF1000	NONE	TRANSFORMER, AUDIO
SS1740	REV 1	FNT PANEL ASSY; MX12, MX170( )
SS1925	REV 3	DISPLAY; MX170C
PC1925	REV 3	PCB, DISPLAY; MX12, MX170( ), MX385
PE1701	NONE	FNT PANEL, ENGRAVED; MX170C
PL1701	REV 2	FNT PANEL, PLASTIC; MX12/170C
PL17777	NONE	FILTER,DISPLAY,UPPER;MX12,MX170(),MX385
PL17778	NONE	FILTER,DISPLAY,LOWER;MX12,MX170(),MX385
SS1922	REV 4	DRIVER ASSY; MX12, MX170( ), MX385
PC1922	REV 4	PCB, DRIVER: MX12, MX170( ), MX385
HM1725	REV 2	CAP, SWITCH
SS1731	REV 5	T/R SWITCH ASSY; MX170C
SM1752	REV 5	T/R CASE; MX170C
SM1753	NONE	T/R COVER

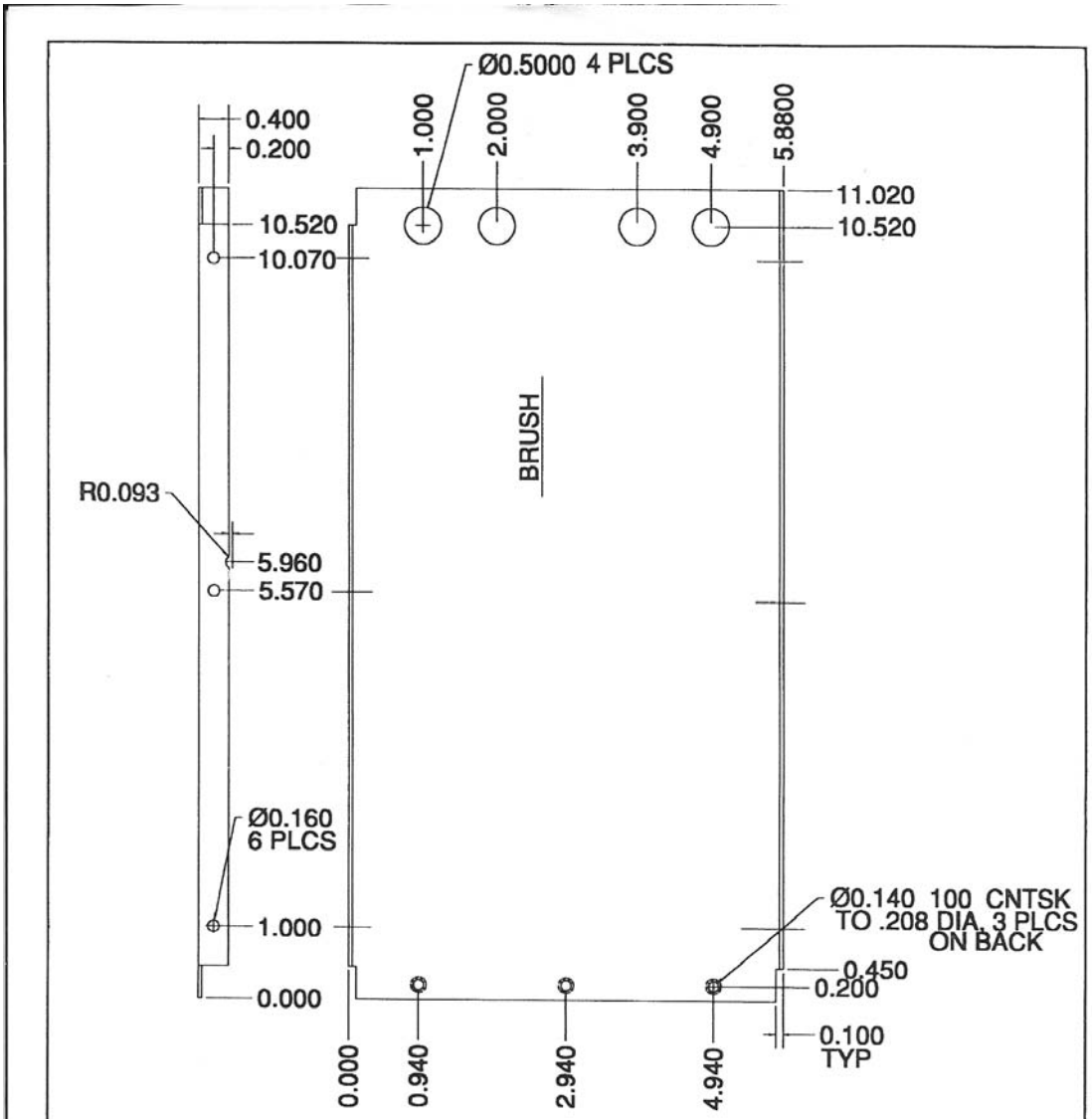
SS1866	REV C	RECEIVER ASSY; COMM (GREEN)
PC1866	REV C	PCB, RECEIVER
SM1840	REV 3	CASE, MODULE
SM1841	REV 3	COVER, MODULE
SM1812	REV 2	GND BRACKET; RX
CA1803	NONE	CABLE ASSY, COAX
CA1866	NONE	CABLE, COMM RECEIVER
CA1804	REV 1	CABLE ASSY, COAX
LFST4N	NONE	INDUCTOR, RF
LFST5N	NONE	INDUCTOR, RF
SS2716	REV A	COMM SYNTHESIZER ASSY
PC2716	REVA	PCB, SYNTHESIZER; COMM
SM1840	REV 3	CASE, MODULE
NB400I	NONE	INSERT, EXTENDED
SM1841	REV 3	COVER, MODULE
SM1814	NONE	GND BRACKET; SYNTH
SS1881	REV C	TRANSMITTER, TOP ASSY
PC1881	REV C	PCB TRANSMITTER
SM1883	REV 9	BASE, TRANSMITTER
SM1813	REV 2	COVER, TRANSMITTER
CA1802	NONE	CABLE ASSY, COAX
CA1801	NONE	CABLE ASSY, COAX
LFS7TN	NONE	INDUCTOR, RF
LFS2TN	NONE	INDUCTOR, RF
LFS4TN	NONE	INDUCTOR, RF
RN0002	NONE	RESISTOR, METAL FILM
SS1867	REV C	RECEIVER ASSY; NAV (BLUE)
PC1866	REV C	PCB, RECEIVER
SM1840	REV 3	CASE, MODULE
SM1841	REV 3	COVER, MODULE
SM1812	REV 2	GND BRACKET; RX
CA1803	NONE	CABLE ASSY, COAX
CA1867	NONE	CABLE, NAV RECEIVER
CA1804	NONE	CABLE ASSY, COAX
LFST4N	NONE	INDUCTOR, RF
LFST5N	NONE	INDUCTOR, RF
SS2714	REV B	NAV SYNTHESIZER ASSY
PC2714	REV B	PCB, SYNTHESIZER; NAV
SM1840	REV 3	CASE, MODULE
SM1841	REV 3	COVER, MODULE
NB400I	NONE	INSERT, EXTENDED


AT170C
Nav Tracking, R33
Comm Tracking, R49
1020 Hz Adjust, R12
Noise Sq, R31
Demod Level R29
4 MHz Osc, C5
4 PLACES
9 PLACES
5 PLACES
P1
P7
P8
P11
P12
TX
RCV
FINAL TEST USING TA0001
PRETEST USING TA0002
TKM, Inc.
SCOTTSDALE, ARIZONA
TOP ASSEMBLY-MX170C
AT170C
SCALE:
MATL
TOLERANCE:
XX +/- .015
XXX +/- .007
ANGLES: +/- 1 DEG
HOLES: +/- .002
FINISH:
DWG. BY: WM
APPROVED:
DATE 9-5-02
REV
USED ON
SHEET 1 OF 2

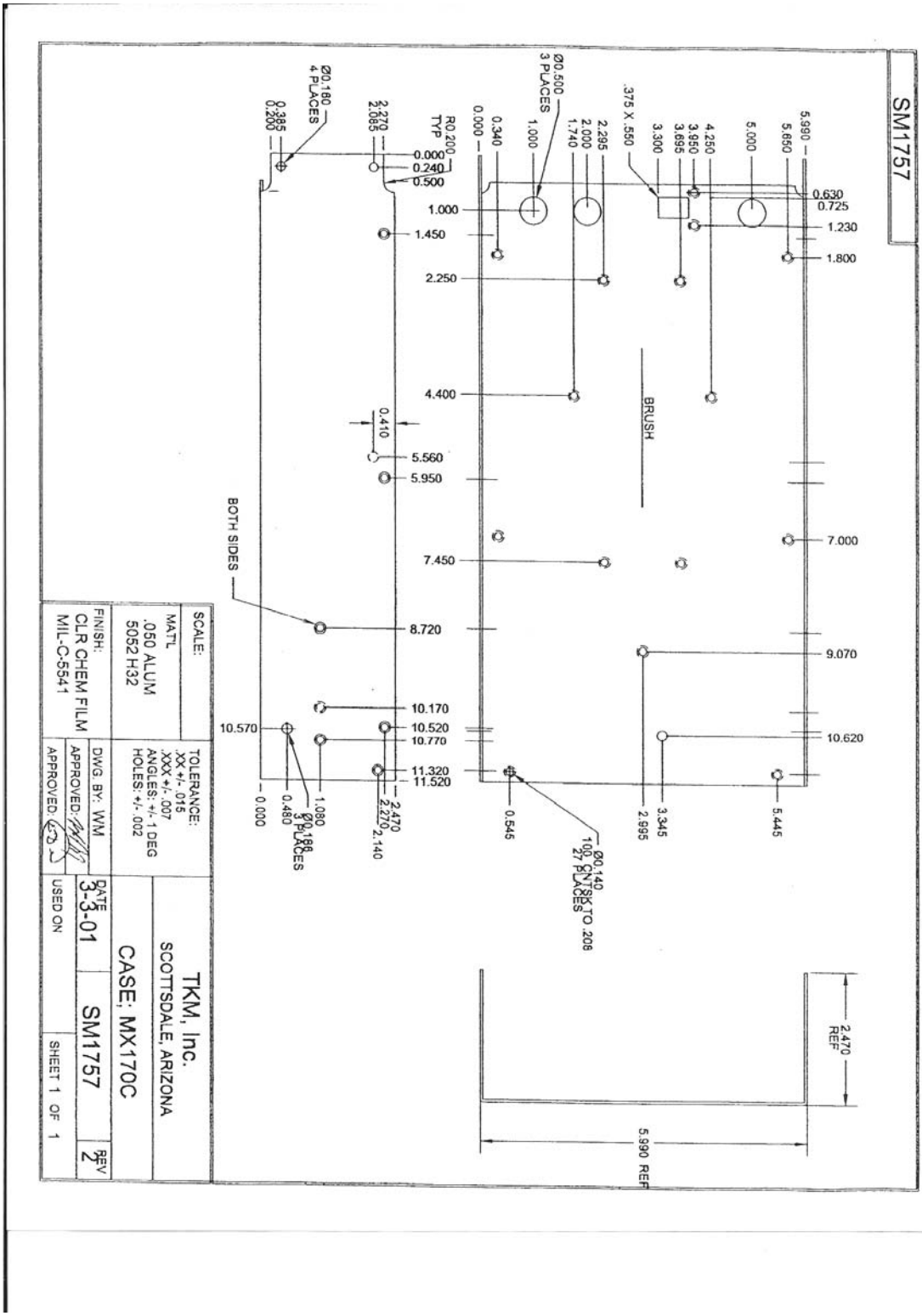
MX170C TOP ASSEMBLY AT170C-0 page 1

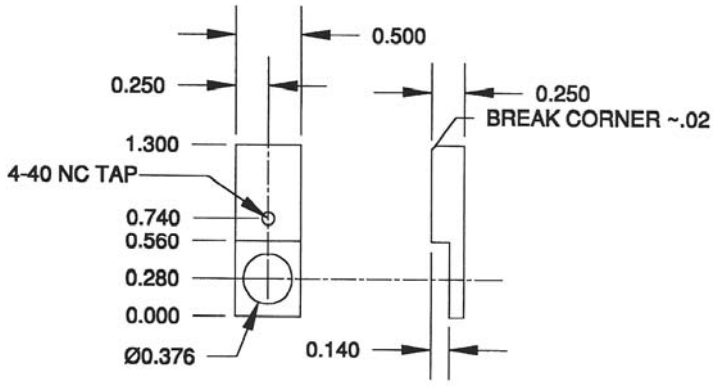
* indicates parts requiring soldermask.

Ref #	Part #	Description	Qty
01	SS1760-9	SUB-ASSEMBLY COMPUTER ASSY; 170B	1
02	SS1750-9	SUB-ASSEMBLY REAR PANEL; MX170B	1
03	SS1740-1	SUB-ASSEMBLY FRONT PANEL; 170; 12; 385.	1
04	MP1704-	MISC. PARTS Insulator; Computer Bd.	1
05	SS2716-A	SUB-ASSEMBLY COMM SYNTHESIZER ASSY	1
06	SS2714-B	SUB-ASSEMBLY NAV SYNTHESIZER ASSY	1
07	SS1866-C	SUB-ASSEMBLY RECEIVER ASSEMBLY COMM(Green)	1
08	SS1867-C	SUB-ASSEMBLY RECIVER ASSEMBLY NAV(blue)	1
09	SS1881-C	SUB-ASSEMBLY TRANSMITTER ASSY	1
10	SS1731-1	SUB-ASSEMBLY T/R ASSY; MX170B	1
11	SM1756-3	SHEET METAL COVER; MX170B	1
12	SM1757-2	SHEET METAL CASE; MX170B	1
13	HM1730-1	HARDWARE; MACHINE COAX; MTG BLOCK	1
14	NB416F-	FASTENERS 4-40x1 P100 SS	1
15	NB400K-	FASTENERS 4-40 KEPS NUT SS	10
16	HS1000-	SPACER 3/16H X 1/2" 4-40 THD	6
17	NB408A-	FASTENERS 4-40x1/2 ASET SS	6
18	EC1005-	CONNECTOR 40 PIN; RIBBON CONN	1
19	NB407F-	FASTENERS 4-40x7/16 P100 SS	4
20	EC1001-	CONNECTOR 10 PIN; RIBBON CONN	2
21	EC1002-	CONNECTOR 14 PIN; RIBBON CONN	2
22	HM1757-4	HARDWARE; MACHINE CLAMP, MX170B	1
23	HM1758-2	HARDWARE; MACHINE BLOCK	1
24	NB8200-	FASTENERS 8-32 X 1.25 Allen Hd. SS	1
25	EC1022-	CONNECTOR COAX CONN; UG/1094; SHORT	1
26	NB403F-	FASTENERS 4-40x3/16 P100 SS	14
27	NB404F-	FASTENERS 4-40x1/4 P100 SS	6
28	NB404P-	FASTENERS 4-40x1/4 PP SS	2
29	MP1740-1	MISC. PARTS NAMEPLATE-MX170C	1

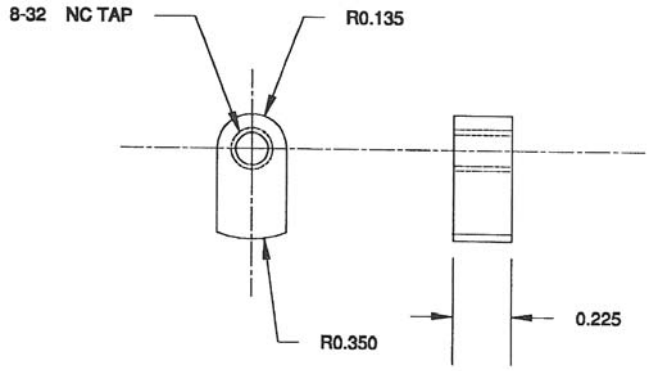


SM1756	SCALE	TOLERANCES .XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	TKM, Inc SCOTTSDALE, ARIZONA
	MAT'L 050 ALUM 5052 H32		COVER; MX170C
	FINISH CLR CHEM FILM MIL-C-5541	DRAWN BY WM APPROVED APPROVED	DATE 5-22-00 / SM1756 / REV 3 USED ON / SHEET 1 OF 1

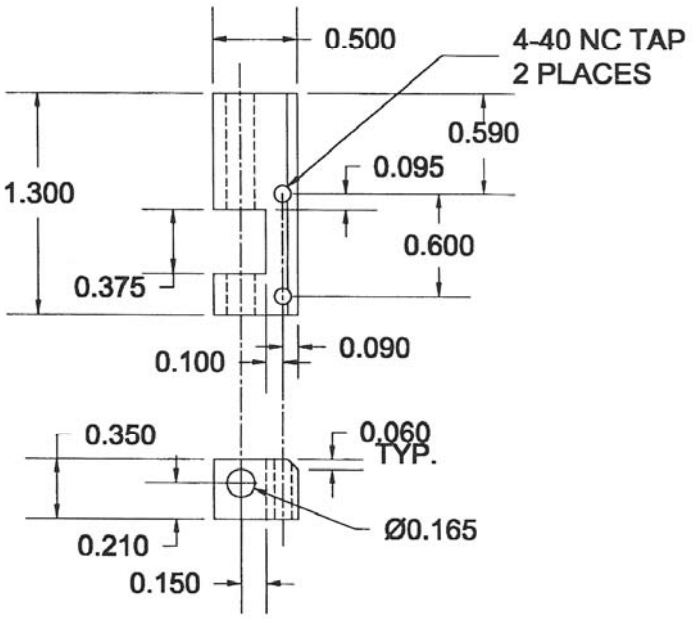

SM1757
BRUSH
BOTH SIDES
TKM, Inc.
SCOTTSDALE, ARIZONA
CASE; MX170C
SM1757
SCALE:
MATL
.050 ALUM
5052 H32
TOLERANCE:
.XX +/- .015
.XXX +/- .007
ANGLES: +/- 1 DEG
HOLES: +/- .002
FINISH:
CLR CHEM FILM
MIL-C-5541
DWG. BY: WM
APPROVED:
DATE
3-3-01
REV
2
USED ON
SHEET 1 OF 1



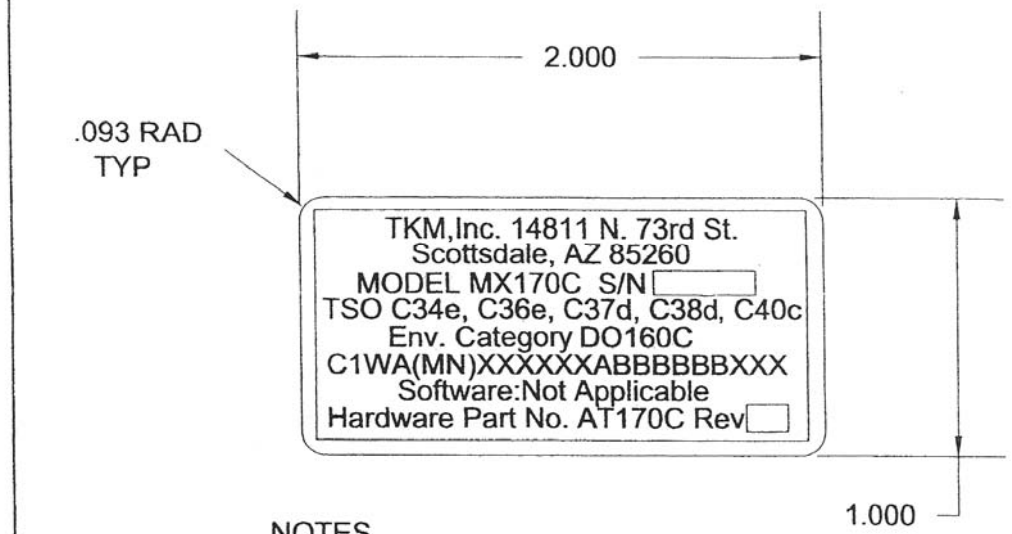
HM1730	SCALE	TOLERANCES .XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L ALUM 6061 t6		MOUNT, COAX		
	FINISH CLR CHEM FILM MIL-C-5541	DRAWN BY WM APPROVED APPROVED	DATE 2-25-00	HM1730	REV 1
			USED ON MX170C	SHEET 1 OF 1	



HM1757	SCALE	TOLERANCES .XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	TKM, Inc SCOTTSDALE, ARIZONA
	MAT'L ALUM ALLOY 6061 T6		CLAMP; MX170C
	FINISH CLR CHEM FILM MIL-C-5541	DRAWN BY WM APPROVED APPROVED	DATE 5-5-00 / HM1757 / REV 4 USED ON / SHEET 1 OF 1



HM1758	SCALE	TOLERANCES	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L ALUM 6061 T6	.XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	CLAMP BLOCK; MX170C		
	FINISH CLR CHEM FILM MIL-C-5541	DRAWN BY WM APPROVED APPROVED	DATE 5-30-00	HM1758	REV 2
			USED ON	SHEET 1 OF 1	

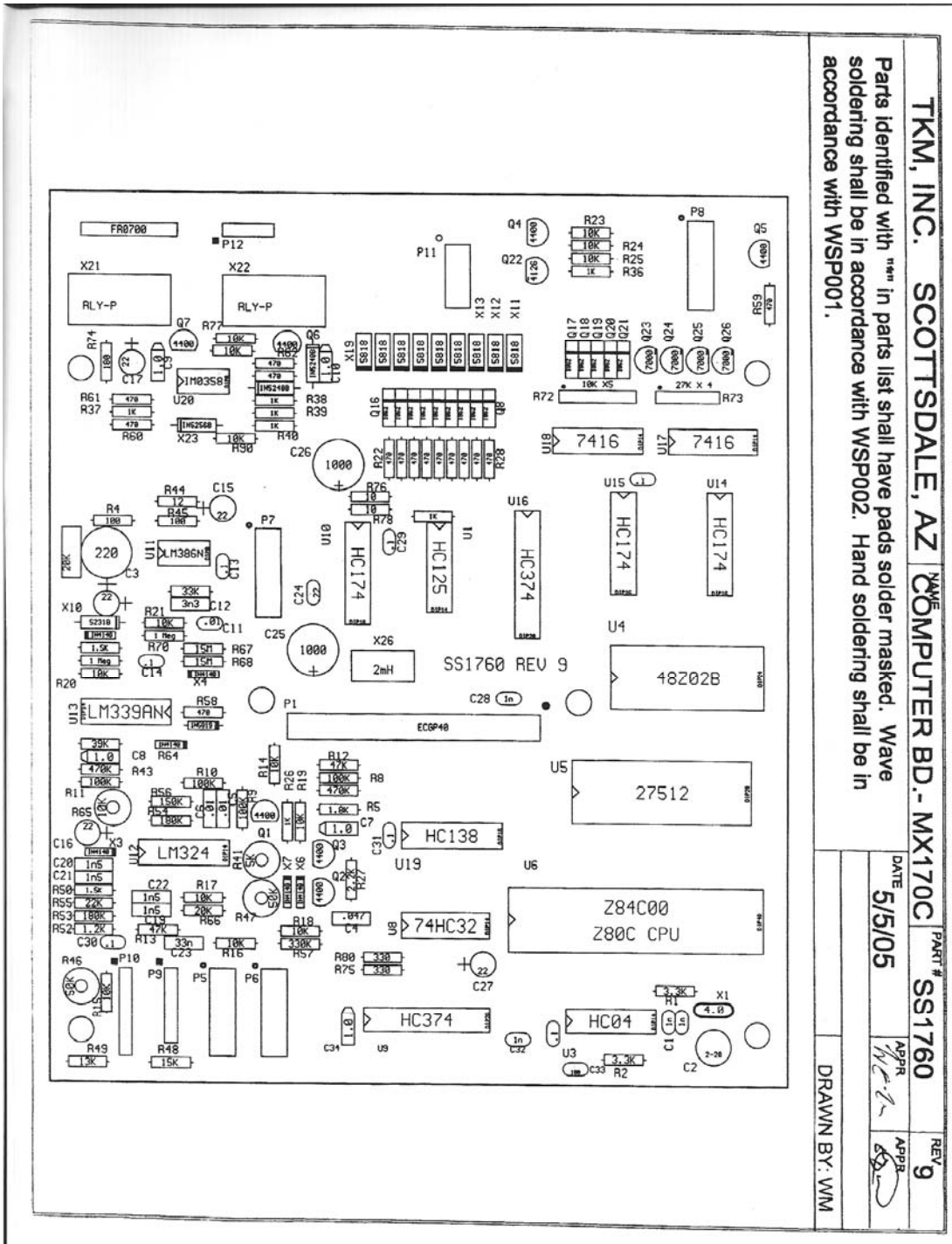


NOTES
1. LETTERING TO BE ARIAL .08 HIGH
2. ALL LETTERS TO BE BLACK
3. ADHESIVE TO BE 3M-467
4. EACH LINE TO BE CENTERED
5. S/N TO BE FOUR DIGITS
6. BORDER TO BE BLACK

MP1740	SCALE	TOLERANCES .XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L .005 ALUM		TSO NAMEPLATE-MX170C		
	FINISH	DRAWN BY WM	DATE 8-9-03	MP1740	REV 0
		APPROVED			
		APPROVED	USED ON	SHEET 1 OF 1	

1. FIRST TWO LINES .09 HIGH
2. LAST 4 LINES .06 HIGH
3. ALL MARKINGS BLACK
4. ADHESIVE: 3M-467
5. CORNER RADIUS 0.125
6. LABEL TO BE 1.5" X .75".

MP-06	SCALE	TOLERANCES .XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L .003 ALUM		NAMEPLATE , MX170C FCC		
	FINISH	DRAWN BY WM	DATE 8-9-03	MP1806	REV 2
		APPROVED WM			
		APPROVED	USED ON	SHEET 1 OF 1	


TKM, INC. SCOTTSDALE, AZ
NAME COMPUTER BD.- MX170C
PART # SS1760
REV 9
DATE 5/5/05
APPR
APPR
DRAWN BY: WM
Parts identified with "*" in parts list shall have pads solder masked. Wave soldering shall be in accordance with WSP002. Hand soldering shall be in accordance with WSP001.
SS1760 REV 9
RLY-P
RLY-P
LM386N
LM339AN
LM324
HC174
HC125
HC374
HC138
74HC32
HC04
7416
7416
HC174
HC174
48Z02B
27512
Z84C00
Z80C CPU
ECGP40
2mH

COMPUTER; MX170B SS1760-9 page 1

* indicates parts requiring soldermask.

Ref #	Part #	Description	Qty
01	PC1760-9	PCB COMPUTER BOARD 170C	1
02	ES1001-	IC SOCKET; DIP 8 PIN; DIP	2
03	ES1002-	IC SOCKET; DIP 14 PIN; DIP	7
04	ES1003-	IC SOCKET; DIP 16 PIN; DIP	4
05	ES1004-	IC SOCKET; DIP 20 PIN; DIP	2
06	ES1005-	IC SOCKET; DIP 24 PIN; DIP	1
07	ES1006-	IC SOCKET; DIP 40 PIN;DIP	1
08	ES1008-	IC SOCKET; DIP 28 PIN DIP	1
C1	CR1024-	CAP; MONO-CERAMIC .001uF; 100V	1
C10	CT1051-	CAP; TANTALUM 1.0/35V; AXIAL	1
C11	CR1033-	CAP; MONO-CERAMIC .01uF; 100V	1
C12	CF3323-	CAPACITOR; FILM .0033/63V	1
C13	CR1043-	CAP; MONO-CERAMIC .1uF; 50V	1
C14	CR1043-	CAP; MONO-CERAMIC .1uF; 50V	1
C15	CE2262-	CAP; ALUM ELECT. 22/50V;RADIAL	1
C16	CE2262-	CAP; ALUM ELECT. 22/50V;RADIAL	1
C17	CE2262-	CAP; ALUM ELECT. 22/50V;RADIAL	1
C19	CF1523-	CAPACITOR; FILM .0015/63V	1
C2*	CB2006-	CAPACITOR; TRIMMER 1-20 PF	1
C20	CF1523-	CAPACITOR; FILM .0015/63V	1
C21	CF1523-	CAPACITOR; FILM .0015/63V	1
C22	CF1523-	CAPACITOR; FILM .0015/63V	1
C23	CF3333-	CAPACITOR; FILM .033/63V	1
C24	CR2242-	CAP; MONO-CERAMIC .22 uF; 100V	1
C25	CE1081-	CAP; ALUM ELECT. 1000/6.3-10V; RADIAL	1
C26	CE1081-	CAP; ALUM ELECT. 1000/6.3-10V; RADIAL	1
C27	CE2262-	CAP; ALUM ELECT. 22/50V;RADIAL	1
C28	CR1024-	CAP; MONO-CERAMIC .001uF; 100V	1
C29	CR1043-	CAP; MONO-CERAMIC .1uF; 50V	1
C3	CE2211-	CAP; ALUM ELECT. 220/50V; RADIAL	1
C30	CR1043-	CAP; MONO-CERAMIC .1uF; 50V	1
C31	CR1043-	CAP; MONO-CERAMIC .1uF; 50V	1
C33	CR2703-	CAP; MONO-CERAMIC 27 PF, 100V radial	1
C34	CT1051-	CAP; TANTALUM 1.0/35V; AXIAL	1
C35	CR1043-	CAP; MONO-CERAMIC .1uF; 50V	1
C36	CR1024-	CAP; MONO-CERAMIC .001uF; 100V	1
C4	CF4733-	CAPACITOR; FILM .047/63V	1
C5	CF1033-	CAPACITOR; FILM .01/63	1
C6	CF1033-	CAPACITOR; FILM .01/63	1
C7	CT1051-	CAP; TANTALUM 1.0/35V; AXIAL	1
C8	CT1051-	CAP; TANTALUM 1.0/35V; AXIAL	1
C9	CT1051-	CAP; TANTALUM 1.0/35V; AXIAL	1
Q1	QX4401-	TRANSISTOR PNP- 2N4401	1
Q10	QX1741-	TRANSISTOR NPN SWICHING; 50 V	1
Q11	QX1741-	TRANSISTOR NPN SWICHING; 50 V	1

* indicates parts requiring soldermask.

Ref #	Part #	Description	Qty
Q12	QX1741-	TRANSISTOR NPN SWICHING; 50 V	1
Q13	QX1741-	TRANSISTOR NPN SWICHING; 50 V	1
Q14	QX1741-	TRANSISTOR NPN SWICHING; 50 V	1
Q15	QX1741-	TRANSISTOR NPN SWICHING; 50 V	1
Q16	QX1741-	TRANSISTOR NPN SWICHING; 50 V	1
Q17	QX1741-	TRANSISTOR NPN SWICHING; 50 V	1
Q18	QX1741-	TRANSISTOR NPN SWICHING; 50 V	1
Q19	QX1741-	TRANSISTOR NPN SWICHING; 50 V	1
Q2	QX4401-	TRANSISTOR PNP- 2N4401	1
Q20	QX1741-	TRANSISTOR NPN SWICHING; 50 V	1
Q21	QX1741-	TRANSISTOR NPN SWICHING; 50 V	1
Q22	QX4126-	TRANSISTOR 2N4126	1
Q23	QX7000-	TRANSISTOR 2N7000	1
Q24	QX7000-	TRANSISTOR 2N7000	1
Q25	QX7000-	TRANSISTOR 2N7000	1
Q26	QX7000-	TRANSISTOR 2N7000	1
Q3	QX4401-	TRANSISTOR PNP- 2N4401	1
Q4	QX4401-	TRANSISTOR PNP- 2N4401	1
Q5	QX4401-	TRANSISTOR PNP- 2N4401	1
Q6	QX4401-	TRANSISTOR PNP- 2N4401	1
Q7	QX4401-	TRANSISTOR PNP- 2N4401	1
Q8	QX1741-	TRANSISTOR NPN SWICHING; 50 V	1
Q9	QX1741-	TRANSISTOR NPN SWICHING; 50 V	1
R1	RC0332-	RESISTOR; CARB. 3.3 Kohm; 5%; 1/4 watt	1
R10	RC0104-	RESISTOR; CARB. 100K 5% 1/4W	1
R11	RC0104-	RESISTOR; CARB. 100K 5% 1/4W	1
R12	RC0473-	RESISTOR; CARB. 47 Kohm; 5%; 1/4 watt	1
R13	RC0473-	RESISTOR; CARB. 47 Kohm; 5%; 1/4 watt	1
R14	RC0103-	RESISTOR; CARB. 10 Kohm; 5%; 1/4 watt	1
R15	RC0103-	RESISTOR; CARB. 10 Kohm; 5%; 1/4 watt	1
R16	RC0103-	RESISTOR; CARB. 10 Kohm; 5%; 1/4 watt	1
R17	RC0103-	RESISTOR; CARB. 10 Kohm; 5%; 1/4 watt	1
R18	RC0103-	RESISTOR; CARB. 10 Kohm; 5%; 1/4 watt	1
R19	RC0103-	RESISTOR; CARB. 10 Kohm; 5%; 1/4 watt	1
R2	RC0332-	RESISTOR; CARB. 3.3 Kohm; 5%; 1/4 watt	1
R20	RC0103-	RESISTOR; CARB. 10 Kohm; 5%; 1/4 watt	1
R21	RC0103-	RESISTOR; CARB. 10 Kohm; 5%; 1/4 watt	1
R22	RC0471-	RESISTOR; CARB. 470 Ohm; 5%; 1/4 watt	1
R23	RC0471-	RESISTOR; CARB. 470 Ohm; 5%; 1/4 watt	1
R24	RC0471-	RESISTOR; CARB. 470 Ohm; 5%; 1/4 watt	1
R25	RC0471-	RESISTOR; CARB. 470 Ohm; 5%; 1/4 watt	1
R26	RC0471-	RESISTOR; CARB. 470 Ohm; 5%; 1/4 watt	1
R27	RC0471-	RESISTOR; CARB. 470 Ohm; 5%; 1/4 watt	1
R28	RC0471-	RESISTOR; CARB. 470 Ohm; 5%; 1/4 watt	1

* indicates parts requiring soldermask.

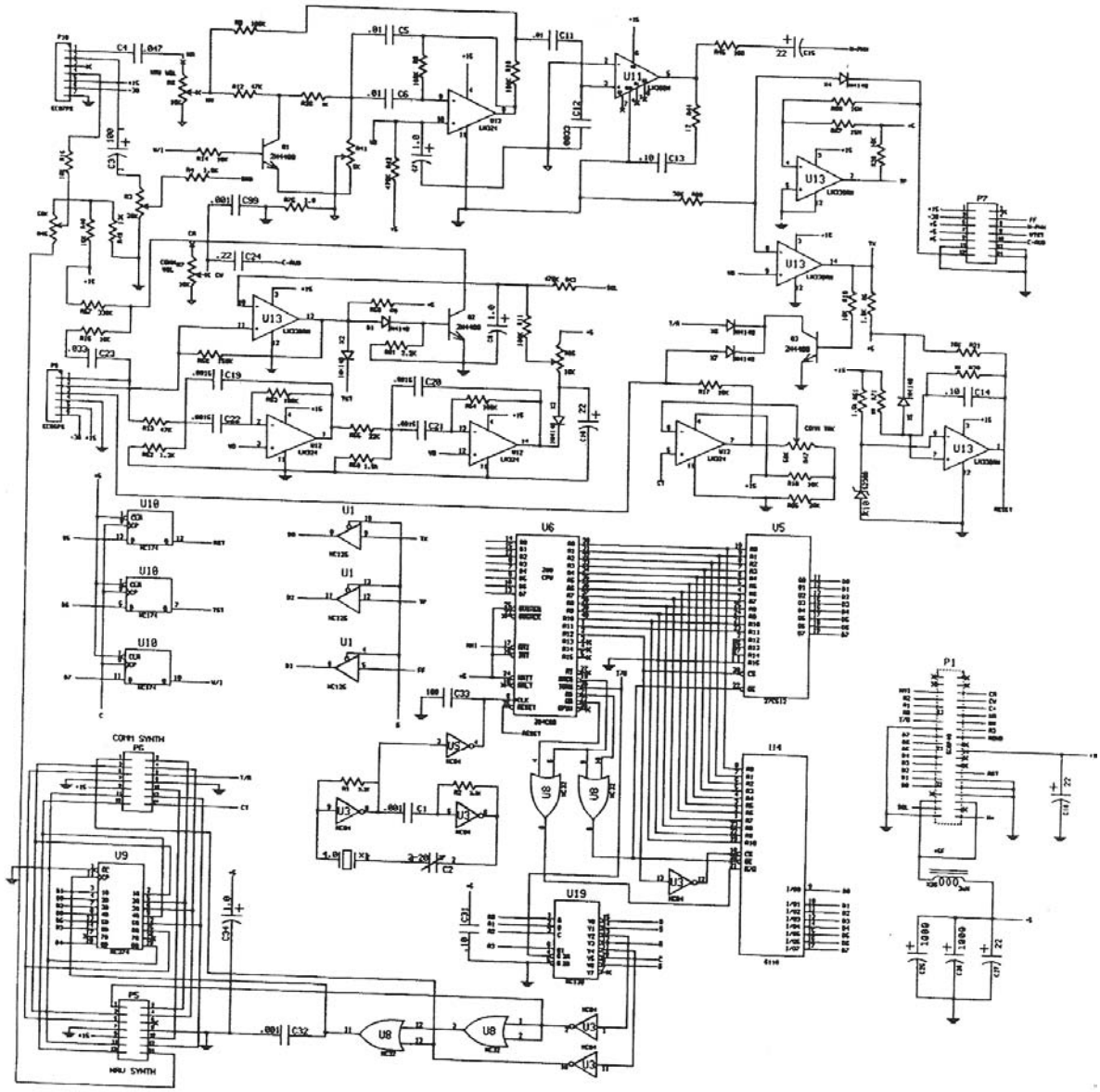
Ref #	Part #	Description	Qty
R29	RC0102-	RESISTOR; CARB. 1 Kohm; 5%; 1/4 watt	1
R30	RC0102-	RESISTOR; CARB. 1 Kohm; 5%; 1/4 watt	1
R36	RC0102-	RESISTOR; CARB. 1 Kohm; 5%; 1/4 watt	1
R37	RC0102-	RESISTOR; CARB. 1 Kohm; 5%; 1/4 watt	1
R38	RC0102-	RESISTOR; CARB. 1 Kohm; 5%; 1/4 watt	1
R39	RC0102-	RESISTOR; CARB. 1 Kohm; 5%; 1/4 watt	1
R4	RC0101-	RESISTOR; CARB. 100 Ohm; 5%; 1/4 watt	1
R40	RC0102-	RESISTOR; CARB. 1 Kohm; 5%; 1/4 watt	1
R41	PW0502-	Top Adj. .3 dia 5K	1
R43	RC0474-	RESISTOR; CARB. 470K 1/4W 5%	1
R44	RC0120-	RESISTOR; CARB. 12 Ohm; 5%; 1/4 watt	1
R45	RC0101-	RESISTOR; CARB. 100 Ohm; 5%; 1/4 watt	1
R46	PW0503-	Top Adj. .3 dia 50K	1
R47	PW0503-	Top Adj. .3 dia 50K	1
R48	RC0105-	RESISTOR; CARB. 1 Megohm; 5%; 1/4 watt	1
R49	RN1302-	RESISTOR; METAL FILM 13K; 1/4W; 1%	1
R5	RC0182-	RESISTOR; CARB. 1.8 Kohm; 5%; 1/4 watt	1
R50	RC0152-	RESISTOR; CARB. 1.5 Kohm; 5%; 1/4 watt	1
R51	RC0152-	RESISTOR; CARB. 1.5 Kohm; 5%; 1/4 watt	1
R52	RC0122-	RESISTOR; CARB. 1.2 Kohm; 5%; 1/4 watt	1
R53	RC0184-	RESISTOR; CARB. 180K 1/4W 5%	1
R54	RC0184-	RESISTOR; CARB. 180K 1/4W 5%	1
R55	RC0222-	RESISTOR; CARB. 2.2 Kohm; 5%; 1/4 watt	1
R56	RC0154-	RESISTOR; CARB. 150K 1/4W 5%	1
R57	RC0334-	RESISTOR; CARB. 330K 1/4W 5%	1
R58	RC0471-	RESISTOR; CARB. 470 Ohm; 5%; 1/4 watt	1
R59	RC0471-	RESISTOR; CARB. 470 Ohm; 5%; 1/4 watt	1
R60	RC0471-	RESISTOR; CARB. 470 Ohm; 5%; 1/4 watt	1
R61	RC0471-	RESISTOR; CARB. 470 Ohm; 5%; 1/4 watt	1
R62	RC0471-	RESISTOR; CARB. 470 Ohm; 5%; 1/4 watt	1
R63	RC0103-	RESISTOR; CARB. 10 Kohm; 5%; 1/4 watt	1
R65	PW0103-	Top Adj. .3 dia 10 K	1
R66	RN2002-	RESISTOR; METAL FILM 20K; 1/4W; 1%	1
R67	RC0156-	RESISTOR; CARB. 15 Megohm; 5%; 1/4 watt	1
R68	RC0156-	RESISTOR; CARB. 15 Megohm; 5%; 1/4 watt	1
R70	RC0105-	RESISTOR; CARB. 1 Megohm; 5%; 1/4 watt	1
R72	RR1035-	RESISTOR NETWORK 10K X 5	1
R73	RR2734-	RESISTOR NETWORK 27K X 4	1
R74	RC0181-	RESISTOR; CARB. 180 Ohm; 5%; 1/4 watt	1
R75	RC0331-	RESISTOR; CARB. 330 Ohm; 5%; 1/4 watt	1
R76	RC0103-	RESISTOR; CARB. 10 Kohm; 5%; 1/4 watt	1
R77	RC0103-	RESISTOR; CARB. 10 Kohm; 5%; 1/4 watt	1
R78	RC0471-	RESISTOR; CARB. 470 Ohm; 5%; 1/4 watt	1
R79	RC0102-	RESISTOR; CARB. 1 Kohm; 5%; 1/4 watt	1

* indicates parts requiring soldermask.

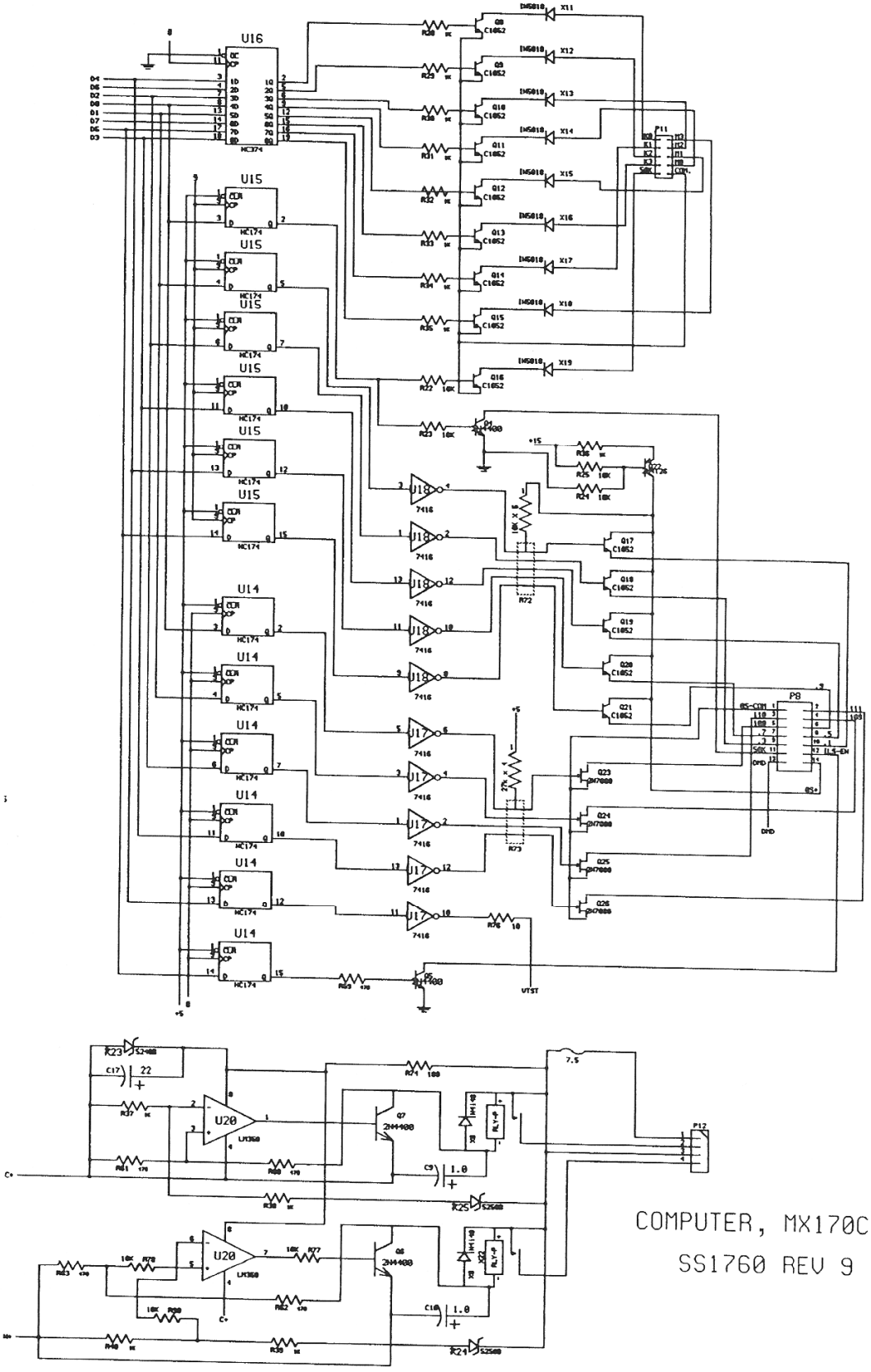
Ref #	Part #	Description	Qty
R8	RC0104-	RESISTOR; CARB. 100K 5% 1/4W	1
R80	RC0331-	RESISTOR; CARB. 330 Ohm; 5%; 1/4 watt	1
R81	RC0393-	RESISTOR; CARB. 39 Kohm; 5%; 1/4 watt	1
R82	RC0471-	RESISTOR; CARB. 470 Ohm; 5%; 1/4 watt	1
R83	RC0474-	RESISTOR; CARB. 470K 1/4W 5%	1
R84	RC0105-	RESISTOR; CARB. 1 Megohm; 5%; 1/4 watt	1
R85	PQ0203-	POT; TRIMMER SIDE ADJ. 20K, Side Adjust	1
R9	RC0104-	RESISTOR; CARB. 100K 5% 1/4W	1
R90	RC0103-	RESISTOR; CARB. 10 Kohm; 5%; 1/4 watt	1
U1*	IH7525-	INT. CKT.; HI SPEED CMOS 74HC125	1
U10*	IH7574-	INT. CKT.; HI SPEED CMOS	1
U11*	IM0386-	INT. CKT.; MISC. LM386	1
U12*	IM0324-	INT. CKT.; MISC. LM324; DIP	1
U13*	IM0339-	INT. CKT.; MISC. LM339	1
U14*	IH7574-	INT. CKT.; HI SPEED CMOS	1
U15*	IH7574-	INT. CKT.; HI SPEED CMOS	1
U16*	IH7774-	INT. CKT.; HI SPEED CMOS 74HC374	1
U17*	IT7416-	INT. CKT.; TTL 7416	1
U18*	IT7416-	INT. CKT.; TTL 7416	1
U19*	IH7538-	INT. CKT.; HI SPEED CMOS 74HC138	1
U20*	IM0358-	INT. CKT.; MISC. LM358N (not ST)	1
U3*	IH7404-	INT. CKT.; HI SPEED CMOS 74HC04	1
U4*	IMZ02B-	INT. CKT.; MISC. RAM; M48Z02-150PC1	1
U5*	IMC512-	INT. CKT.; MISC. 64K X 8 EPROM	1
U6*	IM0080-	INT. CKT.; MISC. Z80	1
U8*	IH7432-	INT. CKT.; HI SPEED CMOS	1
U9*	IH7774-	INT. CKT.; HI SPEED CMOS 74HC374	1
X1	XT4032-	CRYSTAL; QUARTZ 4.032 MHz; HC18A/U	1
X10	DD5231-	DIODE ZENER; 1N5231	1
X11	DD5819-	DIODE 1N5819	1
X12	DD5819-	DIODE 1N5819	1
X13	DD5819-	DIODE 1N5819	1
X14	DD5819-	DIODE 1N5819	1
X15	DD5819-	DIODE 1N5819	1
X16	DD5819-	DIODE 1N5819	1
X17	DD5819-	DIODE 1N5819	1
X18	DD5819-	DIODE 1N5819	1
X19	DD5819-	DIODE 1N5819	1
X2	DD5240-	DIODE ZENER; 1N5240	1
X20	MP1709-	MISC. PARTS FUSE RESTTABLE 7 A	1
X21	KA1807-	RELAY 12v; 170C COMPUTER	1
X22	KA1807-	RELAY 12v; 170C COMPUTER	1
X23	DD5256-	DIODE ZENER; 1N5256	1
X26	LF1752-	INDUCTOR; FIXED CHOKE,FILTER	1

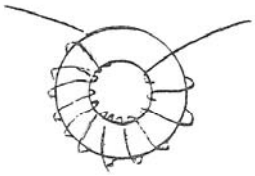
* indicates parts requiring soldermask.

Ref #	Part #	Description	Qty
X3	DD4148-	DIODE 1N4148	1
X4	DD4148-	DIODE 1N4148	1
X5	DD5819-	DIODE 1N5819	1
X6	DD4148-	DIODE 1N4148	1
X7	DD4148-	DIODE 1N4148	1
X8	DD5240-	DIODE ZENER; 1N5240	1
X9	DD4148-	DIODE 1N4148	1
~1	MP1037-	MISC. PARTS CORE; TORROID (Lg)	1



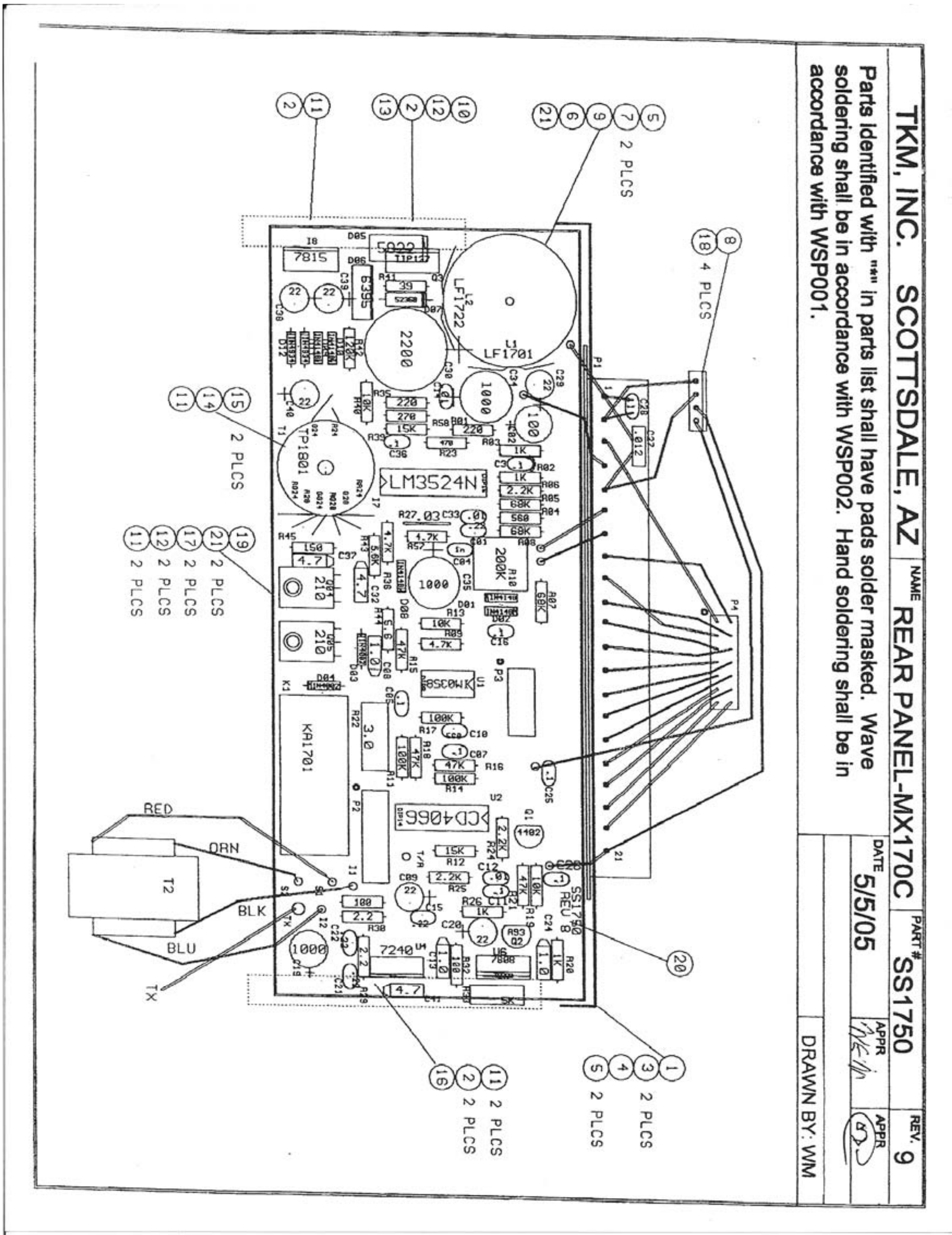
COMPUTER, MX170C SS1760 REV 9


COMPUTER, MX170C
SS1760 REV 9



WIND 12 TURNS,
#22 AWG ON MP1037
(MICROMETALS P/N 5943001101)

LF1752	SCALE NONE	TOLERANCES .XX ± .016 .XXX ± .008 ANGLES ± 1 DEG. FRACT. ± 1/32	MICHEL avionics prods. SCOTTSDALE, ARIZONA	
	MAT'L		CHOKE, FILTER	
	FINISH	DRAWN BY WM APPROVED APPROVED	DATE 10-11-92	LF1752 REV
			USED ON MX11,12,170(),385 COMP BD MX12 REAR PANEL	SHEET OF


TKM, INC. SCOTTSDALE, AZ
NAME REAR PANEL-MX170C
PART# SS1750
REV. 9
DATE 5/5/05
APPR
APPR
DRAWN BY: WM
Parts identified with "*" in parts list shall have pads solder masked. Wave soldering shall be in accordance with WSP002. Hand soldering shall be in accordance with WSP001.
2 PLCS
4 PLCS
RED
ORN
BLK
BLU
T2
TX
LM3524N
KA1701
7815
7240
2200
1000
SS1750 REV 8

MX170B/C REAR PANEL SS1750-9 page 1

* indicates parts requiring soldermask.

Ref #	Part #	Description	Qty
01	PC1750-9	PCB REAR PANEL; 170 C	1
03*	EC1706-	CONNECTOR HOUSING; 4 PIN	1
04*	EC1806-	CONNECTOR CRIMP PINS; SMALL	4
05*	HS1008-	SPACER 3/16 HEX x1"; 4-40 THD	1
06*	MP1051-	MISC. PARTS NYLON SHOULDER WASHER	1
07*	MP1052-	MISC. PARTS MICA INSULATOR	1
08*	NB404P-	FASTENERS 4-40x1/4 PP SS	1
09*	NB400K-	FASTENERS 4-40 KEPS NUT SS	2
11*	NB1488-	FASTENERS #4 SOLDER LUG	1
12*	NB408P-	FASTENERS 4-40x1/2 PP SS	3
13*	NB410P-	FASTENERS 4-40x5/8 PP SS	1
14*	NB412P-	FASTENERS 4-40x3/4 PP SS	1
15*	NB401W-	FASTENERS #4 NYLON FLAT WASHER	2
17*	NB400N-	FASTENERS 4-40 SM NUT SS	7
18*	NB405F-	FASTENERS 4-40x5/16 P100 SS	1
19*	NB8NYW-	FASTENERS #8 NYLON FLAT WASHER	2
20*	HM1759-	HARDWARE; MACHINE HEATSINK; LARGE	1
21*	HM1755-	HARDWARE; MACHINE HEAT SINK; 170B (SM)	1
22*	SM1755-1	SHEET METAL REAR PANEL; MX170B	1
23	ES1003-	IC SOCKET; DIP 16 PIN; DIP	1
24*	NB402W-	FASTENERS #4 SPLIT LOCK WASHER SS	5
25*	HM1756-	HARDWARE; MACHINE MOUNTING TAB - MX170C	1
C1	CR2242-	CAP; MONO-CERAMIC .22 uF; 100V	1
C10	CR5616-	CAP; MONO-CERAMIC 560 PF; 100V	1
C11	CR1043-	CAP; MONO-CERAMIC .1uF; 50V	1
C12	CR1033-	CAP; MONO-CERAMIC .01uF; 100V	1
C13	CT1052-	CAP; TANTALUM 1.0/35V; RADIAL	1
C14	CR1033-	CAP; MONO-CERAMIC .01uF; 100V	1
C15	CR2242-	CAP; MONO-CERAMIC .22 uF; 100V	1
C16	CR1043-	CAP; MONO-CERAMIC .1uF; 50V	1
C19	CE1081-	CAP; ALUM ELECT. 1000/6.3-10V; RADIAL	1
C2	CE1012-	CAP; ALUM ELECT. 100/16-25V; RADIAL	1
C20	CE2262-	CAP; ALUM ELECT. 22/50V;RADIAL	1
C21	CR2242-	CAP; MONO-CERAMIC .22 uF; 100V	1
C22	CR2242-	CAP; MONO-CERAMIC .22 uF; 100V	1
C24	CT1052-	CAP; TANTALUM 1.0/35V; RADIAL	1
C25	CR1043-	CAP; MONO-CERAMIC .1uF; 50V	1
C26*	CR1043-	CAP; MONO-CERAMIC .1uF; 50V	1
C27*	CF2235-	CAPACITOR; FILM .022 uF; 160V Axial	1
C28	CR1043-	CAP; MONO-CERAMIC .1uF; 50V	1
C29	CE2262-	CAP; ALUM ELECT. 22/50V;RADIAL	1
C3	CR1043-	CAP; MONO-CERAMIC .1uF; 50V	1
C30	CE2283-	CAP; ALUM ELECT. 2200/35-50V; RADIAL	1
C32	CT4752-	CAP; TANTALUM 4.7UF/20V; RADIAL	1
C33	CR1033-	CAP; MONO-CERAMIC .01uF; 100V	1

* indicates parts requiring soldermask.

Ref #	Part #	Description	Qty
C34	CE1081-	CAP; ALUM ELECT. 1000/6.3-10V; RADIAL	1
C35	CE1081-	CAP; ALUM ELECT. 1000/6.3-10V; RADIAL	1
C36	CR1043-	CAP; MONO-CERAMIC .1uF; 50V	1
C37	CT4752-	CAP; TANTALUM 4.7UF/20V; RADIAL	1
C38	CE2262-	CAP; ALUM ELECT. 22/50V;RADIAL	1
C39	CE2262-	CAP; ALUM ELECT. 22/50V;RADIAL	1
C4	CR1024-	CAP; MONO-CERAMIC .001uF; 100V	1
C40	CE2262-	CAP; ALUM ELECT. 22/50V;RADIAL	1
C41	CT4752-	CAP; TANTALUM 4.7UF/20V; RADIAL	1
C5	CR1043-	CAP; MONO-CERAMIC .1uF; 50V	1
C7	CR1043-	CAP; MONO-CERAMIC .1uF; 50V	1
C8	CT1052-	CAP; TANTALUM 1.0/35V; RADIAL	1
C9	CE2262-	CAP; ALUM ELECT. 22/50V;RADIAL	1
D1	DD4148-	DIODE 1N4148	1
D10	DD4148-	DIODE 1N4148	1
D11	DD4934-	DIODE 1N4934	1
D12	DD4934-	DIODE 1N4934	1
D2	DD4148-	DIODE 1N4148	1
D3	DD4002-	DIODE 1N4002	1
D4	DD4002-	DIODE 1N4002	1
D5	DD5822-	DIODE 1N5822	1
D6	DD6395-	DIODE SCR; 2N6395 or 2N6504	1
D7	DD5235-	DIODE ZENER; 1N5235	1
D8	DD4148-	DIODE 1N4148	1
D9	DD4148-	DIODE 1N4148	1
K1	KA1701-	RELAY 170C REAR PANEL RELAY	1
L1*	LF1701-1	INDUCTOR; FIXED TRANSFORMER INVERTER	1
L2*	LF1722-	INDUCTOR; FIXED TRANSFORMER INVERTER	1
P1*	EC1701-	CONNECTOR 42 PIN CONN; MALE	1
P2	ECGP14-	CONNECTOR 14 PIN Board Plug	1
P3	ECGP10-	CONNECTOR 10 PIN BOARD PLUG	1
P4*	EC1002-	CONNECTOR 14 PIN; RIBBON CONN	1
P5*	EC1706-	CONNECTOR HOUSING; 4 PIN	1
Q1	QX4403-	TRANSISTOR PNP 2N4403	1
Q2	QX0A93-	TRANSISTOR MPSA93	1
Q3*	QX0127-	TRANSISTOR TIP127, PNP Darlington, 100V	1
Q4*	QX0210-	TRANSISTOR MJE210	1
Q5*	QX0210-	TRANSISTOR MJE210	1
R1	RC0221-	RESISTOR; CARB. 220 Ohm; 5%; 1/4 watt	1
R10*	PT0204-	POT; TRIMMER TOP ADJ. 200K	1
R11	RC0104-	RESISTOR; CARB. 100K 5% 1/4W	1
R12	RC0153-	RESISTOR; CARB. 15 Kohm; 5%; 1/4 watt	1
R13	RC0103-	RESISTOR; CARB. 10 Kohm; 5%; 1/4 watt	1
R14	RC0104-	RESISTOR; CARB. 100K 5% 1/4W	1

MX170B/C REAR PANEL SS1750-9 page 3

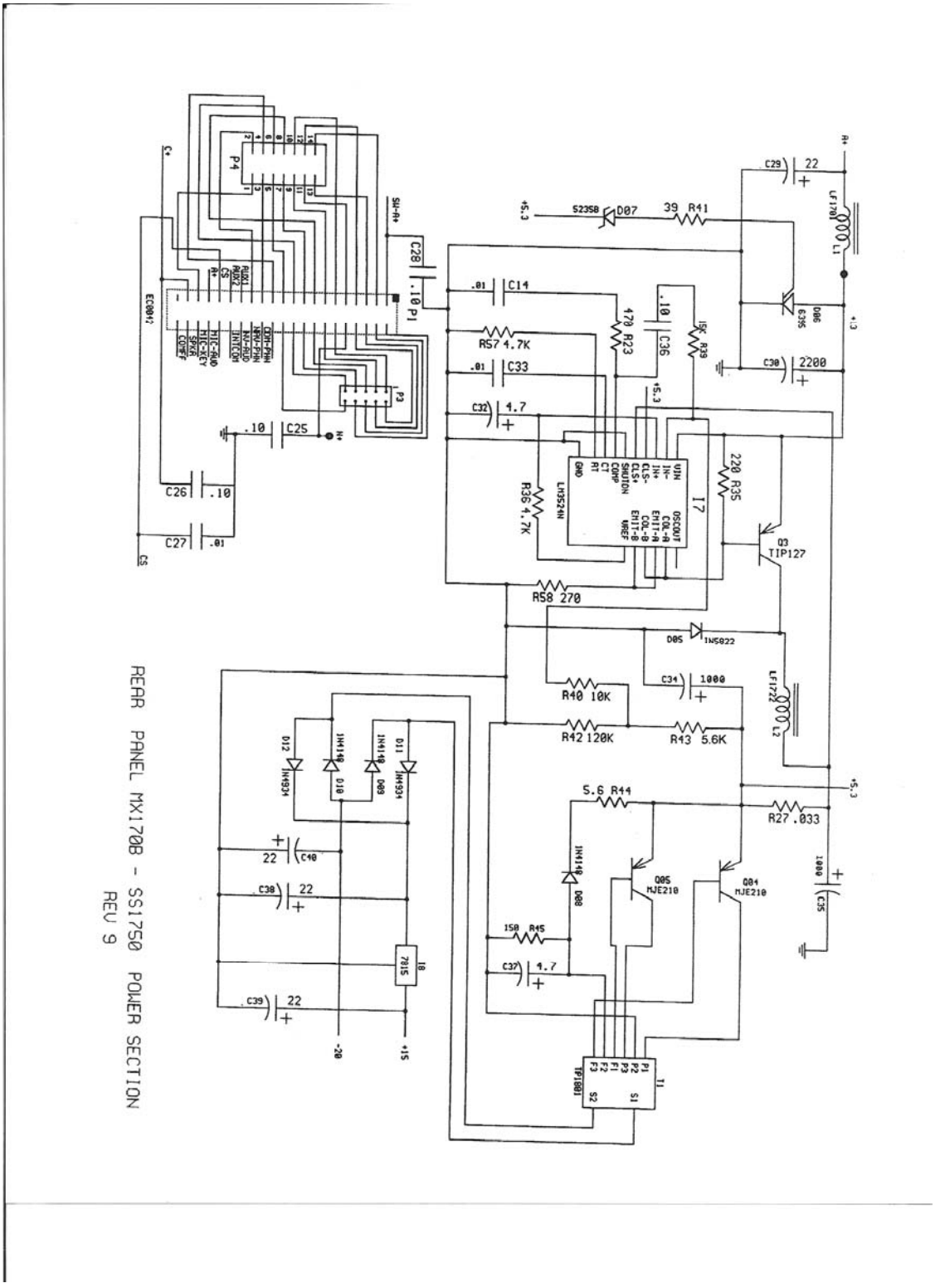
* indicates parts requiring soldermask.

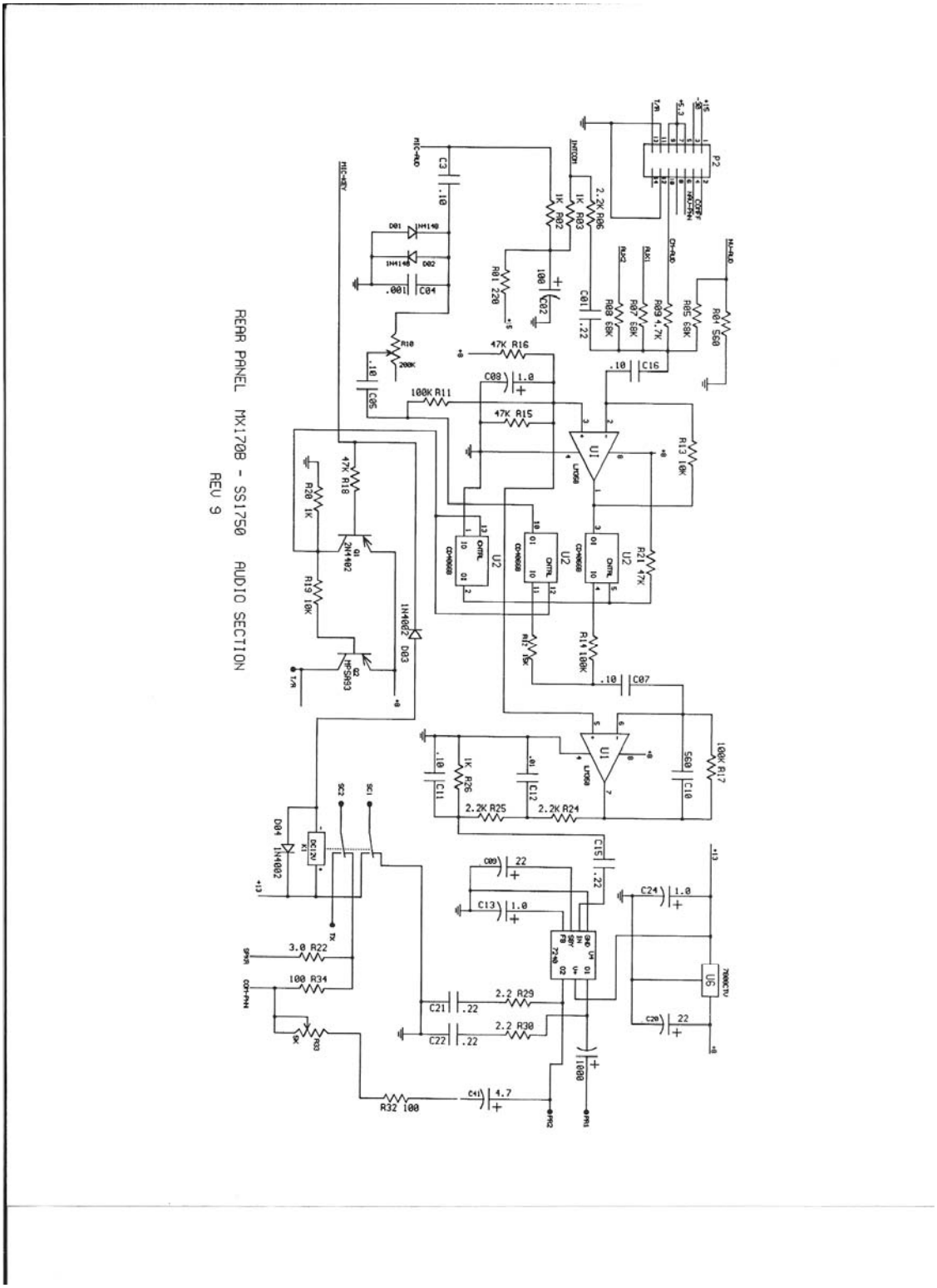
Ref #	Part #	Description	Qty
R15	RC0473-	RESISTOR; CARB. 47 Kohm; 5%; 1/4 watt	1
R16	RC0473-	RESISTOR; CARB. 47 Kohm; 5%; 1/4 watt	1
R17	RC0104-	RESISTOR; CARB. 100K 5% 1/4W	1
R18	RC0473-	RESISTOR; CARB. 47 Kohm; 5%; 1/4 watt	1
R19	RC0103-	RESISTOR; CARB. 10 Kohm; 5%; 1/4 watt	1
R2	RC0102-	RESISTOR; CARB. 1 Kohm; 5%; 1/4 watt	1
R20	RC0102-	RESISTOR; CARB. 1 Kohm; 5%; 1/4 watt	1
R21	RC0473-	RESISTOR; CARB. 47 Kohm; 5%; 1/4 watt	1
R22	RR1700-	RESISTOR NETWORK 3 OHM WIRE WOUND	1
R23	RC0471-	RESISTOR; CARB. 470 Ohm; 5%; 1/4 watt	1
R24	RC0222-	RESISTOR; CARB. 2.2 Kohm; 5%; 1/4 watt	1
R25	RC0222-	RESISTOR; CARB. 2.2 Kohm; 5%; 1/4 watt	1
R26	RC0102-	RESISTOR; CARB. 1 Kohm; 5%; 1/4 watt	1
R27	RN0001-	RESISTOR; METAL FILM .03 Ohm; 1" long	1
R29	RC02R2-	RESISTOR; CARB. 2.2 OHM 1/4W 5%	1
R3	RC0102-	RESISTOR; CARB. 1 Kohm; 5%; 1/4 watt	1
R30	RC02R2-	RESISTOR; CARB. 2.2 OHM 1/4W 5%	1
R32	RC0101-	RESISTOR; CARB. 100 Ohm; 5%; 1/4 watt	1
R33*	PQ0502-	POT; TRIMMER SIDE ADJ. 5K	1
R34	RC0101-	RESISTOR; CARB. 100 Ohm; 5%; 1/4 watt	1
R35	RC0221-	RESISTOR; CARB. 220 Ohm; 5%; 1/4 watt	1
R36	RC0472-	RESISTOR; CARB. 4.7 Kohm; 5%; 1/4 watt	1
R39	RC0153-	RESISTOR; CARB. 15 Kohm; 5%; 1/4 watt	1
R4	RC0561-	RESISTOR; CARB. 560 Ohm; 5%; 1/4 watt	1
R40	RC0103-	RESISTOR; CARB. 10 Kohm; 5%; 1/4 watt	1
R41	RC0390-	RESISTOR; CARB. 39 OHM; 1/4WATT 5%	1
R42	RC0124-	RESISTOR; CARB. 120K 1/4W 5%	1
R43	RC0562-	RESISTOR; CARB. 5.6 Kohm; 5%; 1/4 watt	1
R44	RC05R6-	RESISTOR; CARB. 5.6 Ohm; 5% 1/4 watt	1
R45	RC0151-	RESISTOR; CARB. 150 Ohm; 5%; 1/4 watt	1
R5	RC0683-	RESISTOR; CARB. 68 Kohm; 5%; 1/4 watt	1
R57	RC0472-	RESISTOR; CARB. 4.7 Kohm; 5%; 1/4 watt	1
R58	RC0271-	RESISTOR; CARB. 270 Ohm; 5%; 1/4 watt	1
R6	RC0222-	RESISTOR; CARB. 2.2 Kohm; 5%; 1/4 watt	1
R7	RC0683-	RESISTOR; CARB. 68 Kohm; 5%; 1/4 watt	1
R8	RC0683-	RESISTOR; CARB. 68 Kohm; 5%; 1/4 watt	1
R9	RC0472-	RESISTOR; CARB. 4.7 Kohm; 5%; 1/4 watt	1
T1*	TP1801-1	TRANSFORMER INVERTER	1
T2*	TF1000-	TRANSFORMER AUDIO; MODULATION	1
U2	IC4066-	INT. CKT; CMOS 14066	1
U4*	IM7240-	INT. CKT.; MISC. AUDIO AMPLIFIER - 12 V	1
U6*	IM7808-	INT. CKT.; MISC. REGULATOR; 8V 7808	1
U7*	IM3524-	INT. CKT.; MISC. VOLTAGE REG LM3524DN	1
U8*	IM7815-	INT. CKT.; MISC. REGULATOR; 15V 7815	1

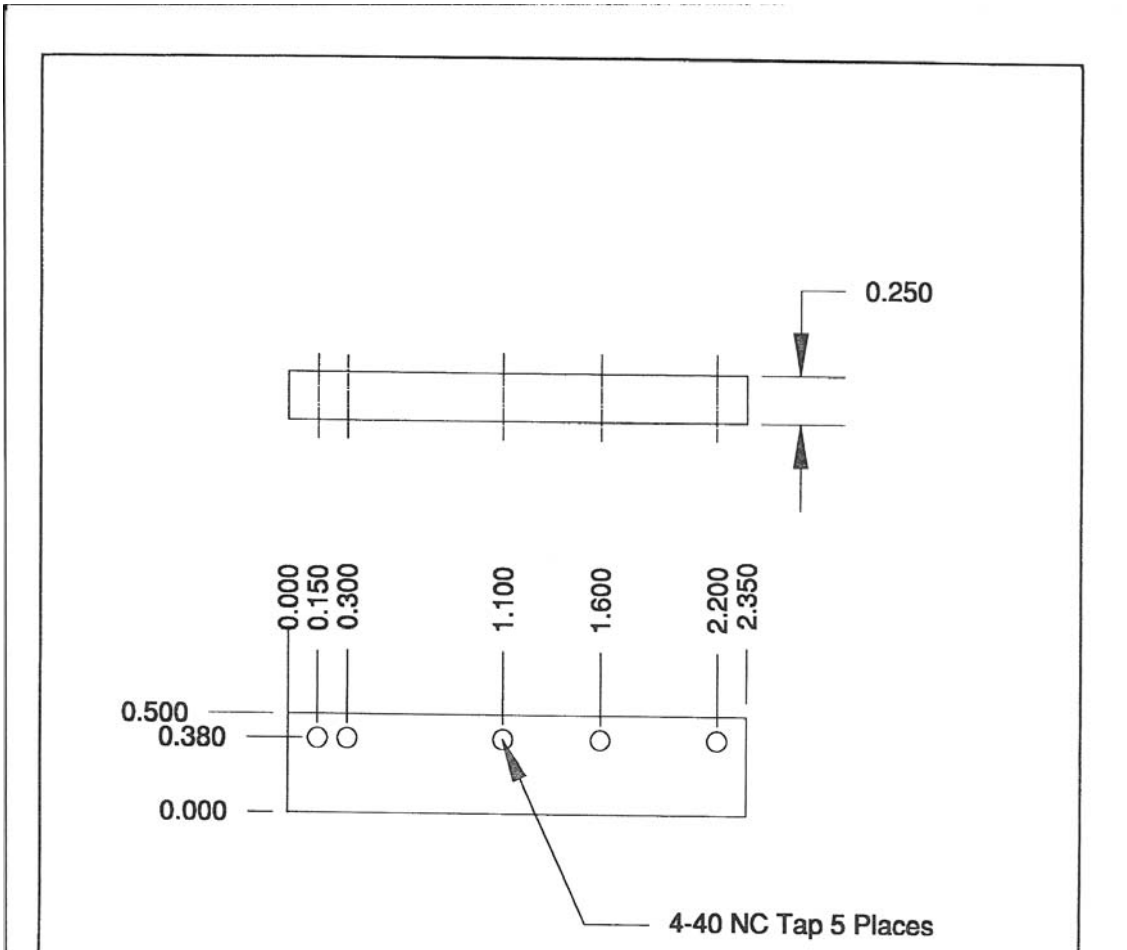
MX170B/C REAR PANEL SS1750-9 page 4

* indicates parts requiring soldermask.

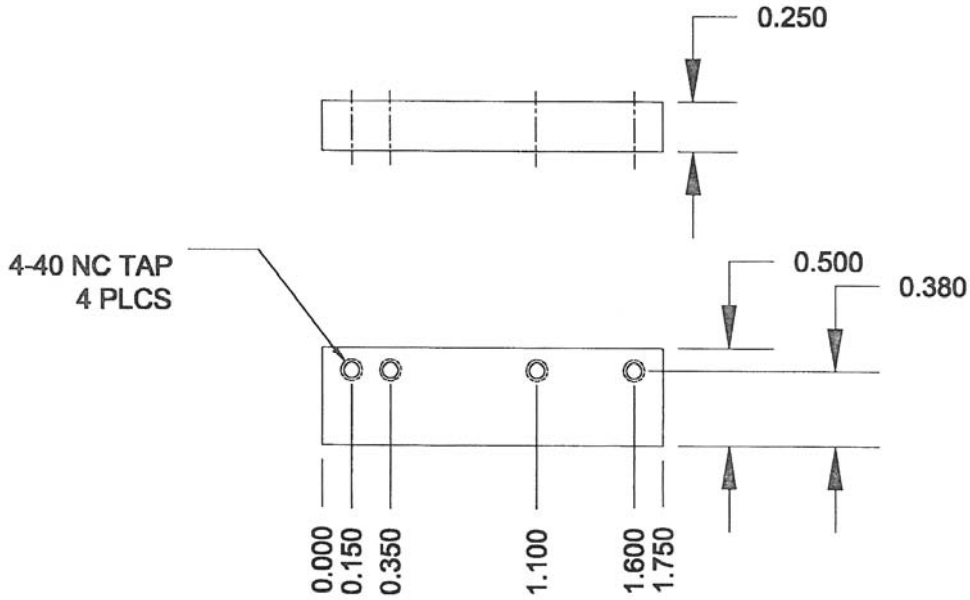
Ref #	Part #	Description	Qty
~1*	MP1039-	MISC. PARTS POT CORE, 2616 3C8	4
~2*	MP1139-	MISC. PARTS BOBBIN; 2616	2
~3*	MP1141-	MISC. PARTS BOBBIN; 1811	1
~4*	MP1041-	MISC. PARTS POT CORE; 1811	2


REAR PANEL MX170B - SS1750 POWER SECTION
REV 9

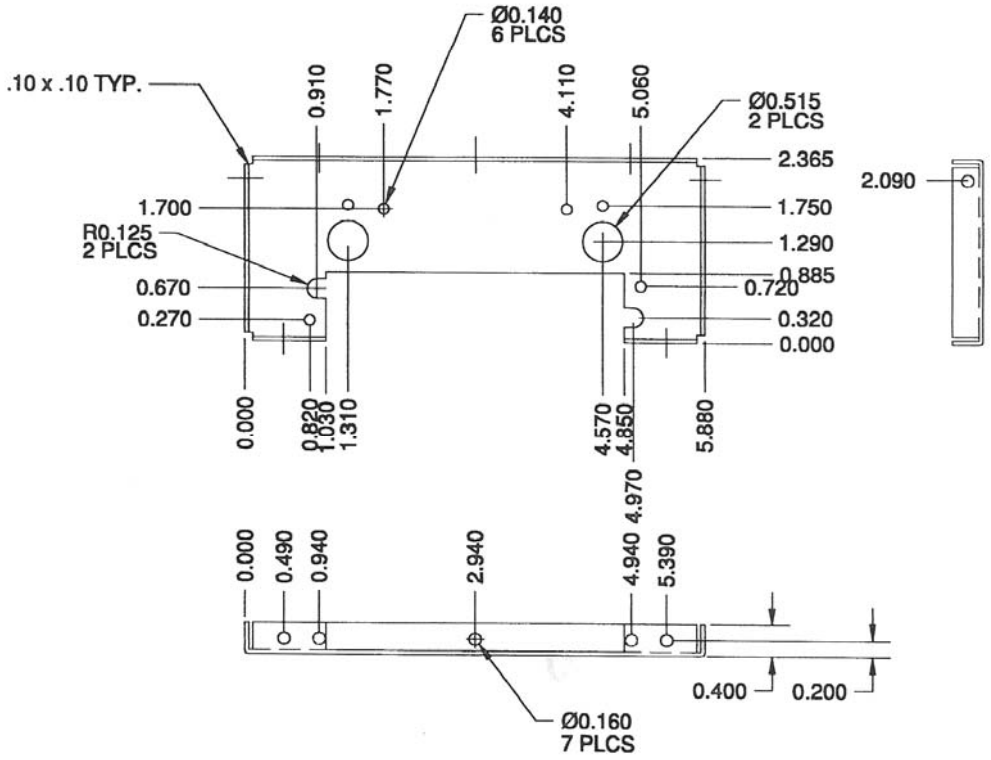

REAR PANEL MX1708 - SS1750 AUDIO SECTION
REV 9



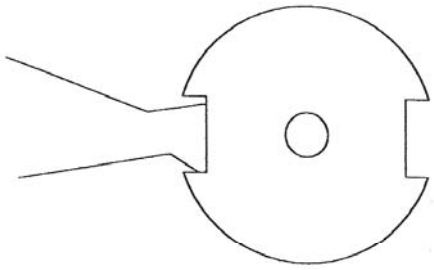
HM1759	SCALE 1 :1	TOLERANCES .XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L ALUM 6061 T6		HEAT SINK, 170C		
	FINISH CLR CHEM FILM MIL-C-5541	DRAWN BY WM	DATE 8-2-99	HM1759	REV
		APPROVED WM			
		APPROVED	USED ON	SHEET 1 OF 1	



HM1755	SCALE	TOLERANCES .XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L ALUM 6066 T6		HEAT SINK, SHORT 170C		
	FINISH CLEAR CHEM FILM PER MIL-C 5541	DRAWN BY WM APPROVED APPROVED	DATE 7-21-00	HM1755	REV
			USED ON	SHEET 1 OF 1	

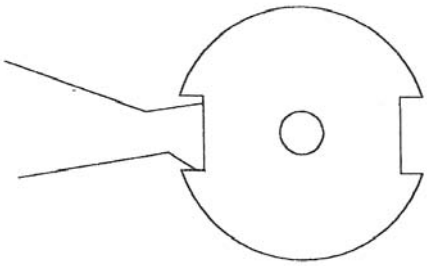


SM1755	SCALE	TOLERANCES .XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	TKM, Inc SCOTTSDALE, ARIZONA
	MAT'L .050 ALUM 5052 H32		PANEL REAR, 170C
	FINISH CLR CHEM FILM MIL-C-5541	DRAWN BY WM APPROVED APPROVED	DATE 5-23-00 / SM1755 / REV 1 USED ON / SHEET 1 OF 1



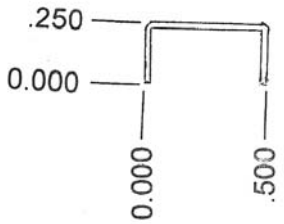
1. WIND 48 TURNS OF #22 AWG ON 2616 FID BOBBIN.
2. INSTALL INTO 2 EA 2616-3B7 CORES WITH .007 MYLAR SPACER.
3. SLEEVE LEADS WITH .5" LONG TUBING.
4. LEADS TO BE 2" LONG.

LF1701	SCALE	TOLERANCES .XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L		CHOKE, INV.		
	FINISH	DRAWN BY WM	DATE 7-21-00	LF1701	REV 1
		APPROVED			
		APPROVED	USED ON (RP)MX170C,300,385	SHEET 1 OF 1	



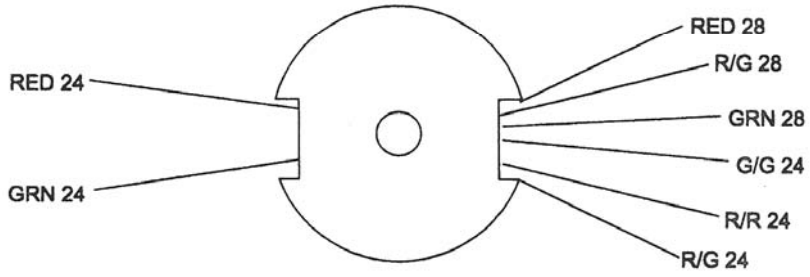
1. WIND 18 TURNS 18 AWG ON BOBBIN 2616 FID.
2. INSTALL IN 2 EA. 2616-3B7 WITH .003 MYLAR SPACER.
3. SLEEVE LEADS WITH .5" LONG TUBING.
4. LEADS TO BE 2" LONG.

LF1722	SCALE	TOLERANCES .XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L		CHOKE FILTER,6 AMP		
	FINISH	DRAWN BY WM	DATE 7-21-00	LF1722	REV
		APPROVED			
		APPROVED	USED ON 170()/MX385 RP, 300PWR BD	SHEET 1 OF 1	



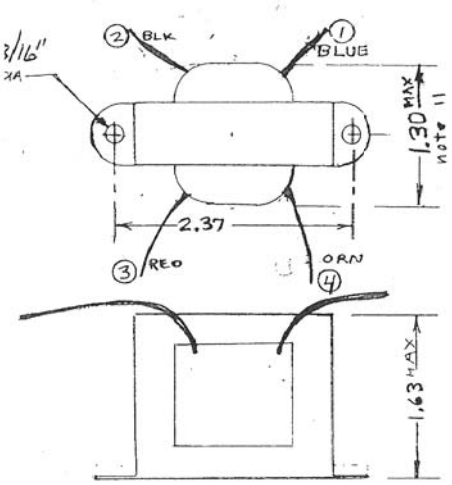
NOTES:
1. CLIP EXCESS AFTER SOLDER

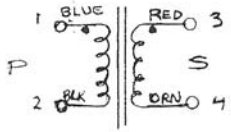
RN0001	SCALE	TOLERANCES	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L #24 AWG MWS 294 ANNEALED	.XXX +/- .015 ANGLES +/- 1 DEG Hole dia:+/-.002	RESISTOR, METAL FILM		
	FINISH	DRAWN BY WM	DATE 6-15-98	RN0001	REV
		APPROVED			
		APPROVED	USED ON MX11 COMP BD MX12.170().300 RP	SHEET 1 OF 1	



1. WIND 14.5 TURNS OF #24 RED AWG SPN ON BOBBIN 1811 F1D AND FORM A TAP .75" LONG.
2. WIND 5 MORE TURNS AND FORM A .75" TAP WITH #24 GREEN AWG SPN.
3. WIND 5 TURNS OF THE GREEN WIRE AND FORM A .75" TAP.
4. WIND 14.5 TURNS OF THE GREEN WIRE.
5. Q-DOPE
6. WIND 2 TURNS OF #28 AWG RED SPN AND FORM A TAP WITH #28 GREEN AWG SPN AND WIND 2 TURNS OF THE GREEN WIRE.
7. Q-DOPE AND TAPE WITH TWO LAYERS OF MYLAR.
8.INSTALL IN2 EA.1811-3B7 CUP CORES.

TP1801	SCALE	TOLERANCES .XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L		TRANSFORMER, 20 V		
	FINISH	DRAWN BY WM	DATE 7-21-00	TP1801	REV 1
		APPROVED			
		APPROVED	USED ON MX11(COMP),12,170C,300,385(RP) 1 OF 1		





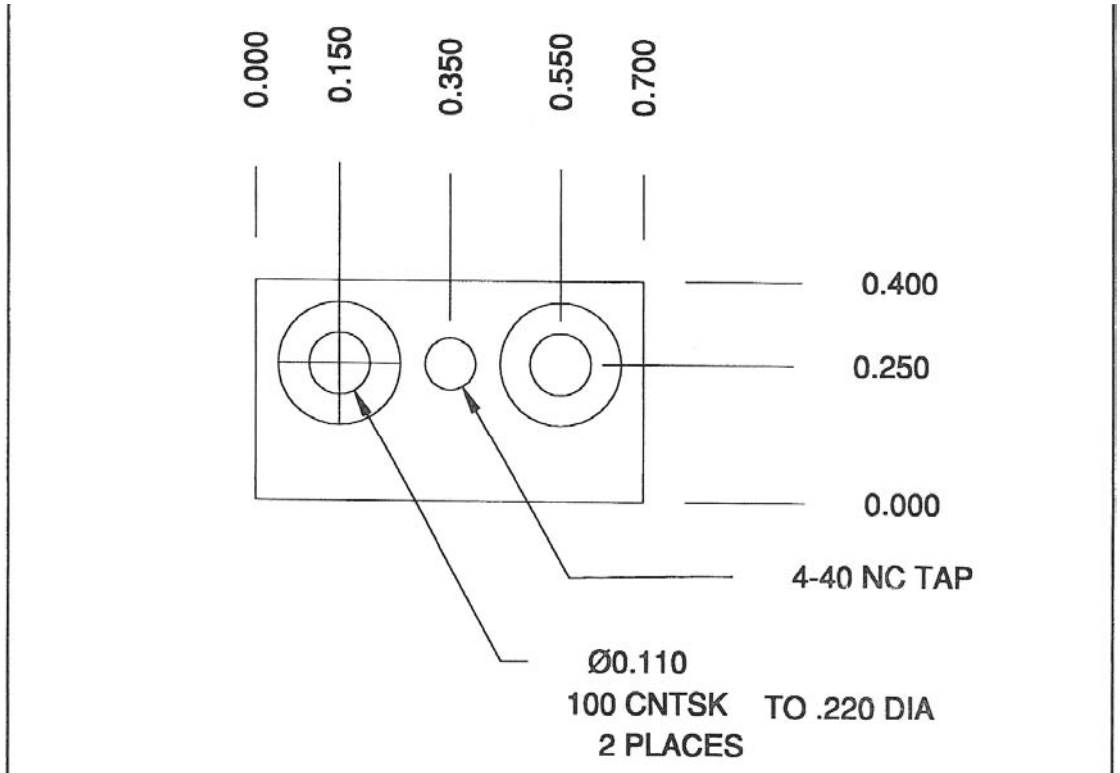
1. PRIMARY VOLTAGE: 22 V-PP SINEWAVE
2. PRIMARY CURRENT: 50 MA DC
3. SECONDARY LOAD: 7.0 Ω
4. MIDBAND SECONDARY VOLTAGE: 26.4 VP-P ± 5% AT NOM LOAD MAXIMUM DC CURRENT
5. SECONDARY CURRENT: 2.5 AMP DC
6. BANDWIDTH: AT LEAST 300 TO 3000 HZ @ -3dB AND AT MAX SIGNAL AND DC CURRENT CONDITIONS
7. OPERATING TEMP: -20 TO +80 C
8. INSULATION: WINDING TO WINDING AND TO CORE; 200 V MIN
9. LEADS: PRIMARY LEADS TO BE #28 AWG AND 6" LONG. SECONDARY LEADS TO BE #18 AWG AND 6" LONG.
10. SECONDARY RESISTANCE: .15 OHM MAX
11. LEAD BULGES NOT TO EXCEED THIS DIMENSION
12. POLARITY: AS SHOWN

TF1000

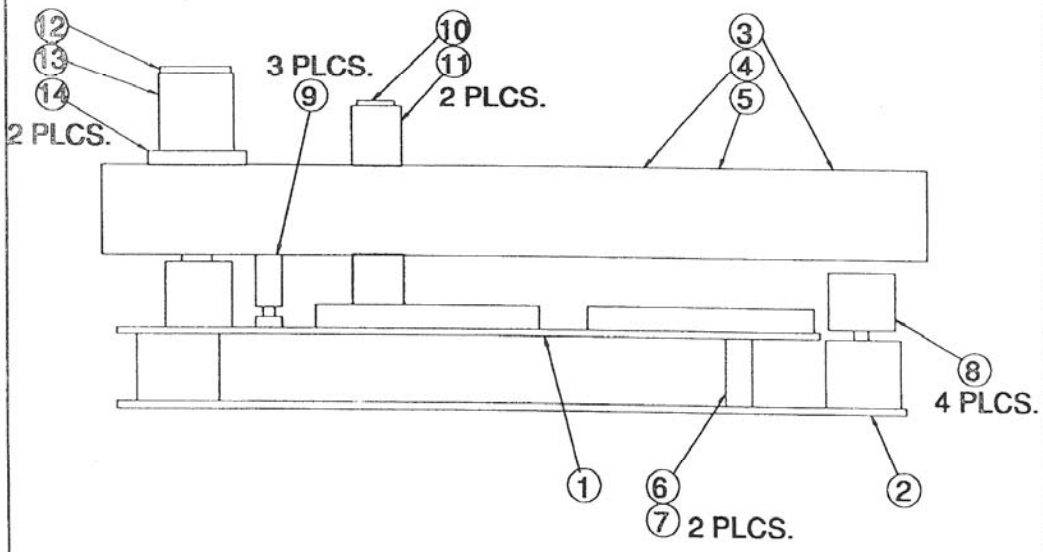
TKM, Inc
SCOTTSDALE, ARIZONA

TRANSFORMER, AUDIO

WM 3-12-83 T.F.1000



HM1756	SCALE	TOLERANCES	TKM, Inc SCOTTSDALE, ARIZONA		
	MATL .09 ALUM 5052 H32	.XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG HOLES +/- .002	TAB, MOUNTING 170C		
	FINISH CLR CHEM FILM MIL-C-5541	DRAWN BY WM APPROVED APPROVED	DATE 8-9-99	HM1756	REV
			USED ON MX170B	SHEET 1 OF 1	

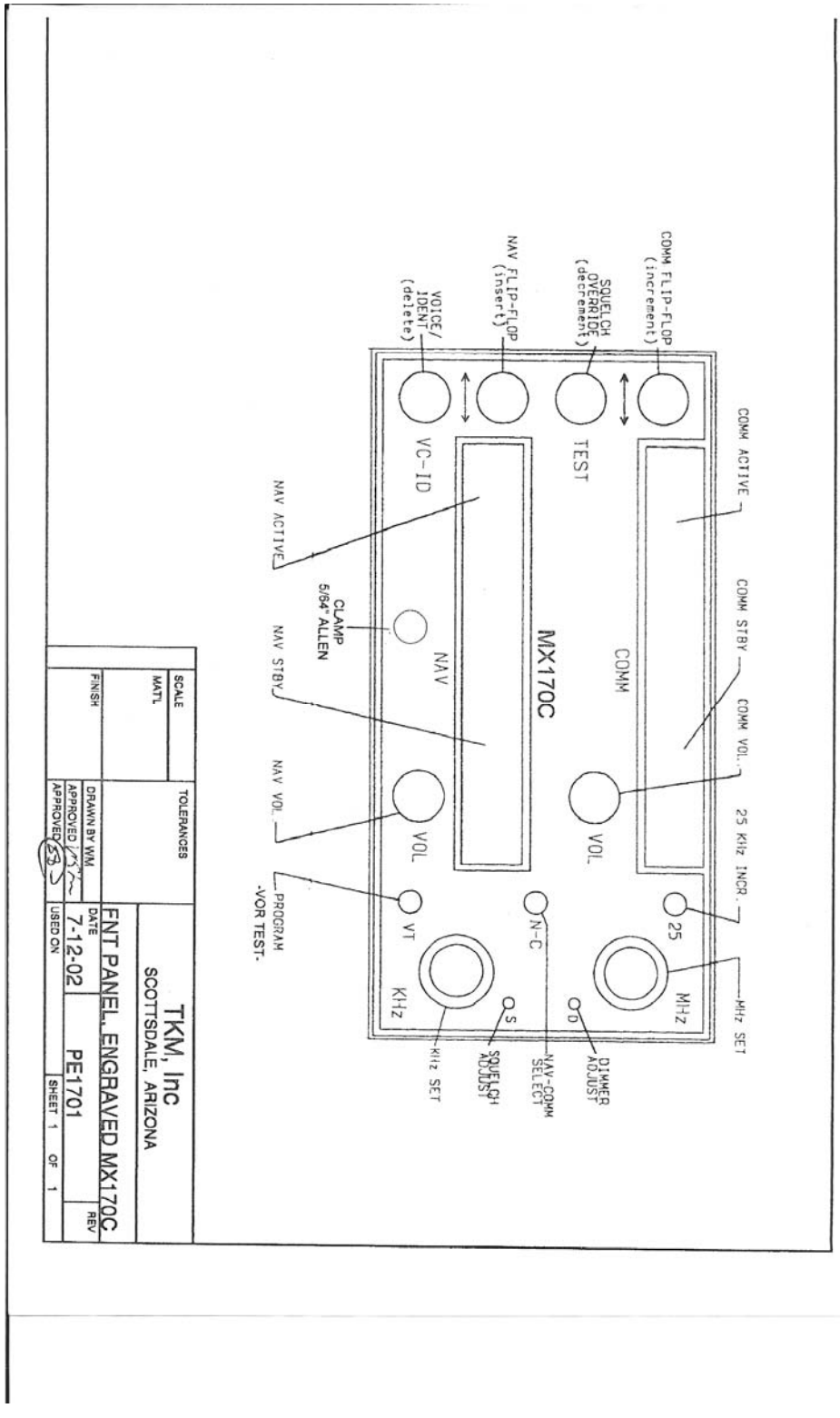


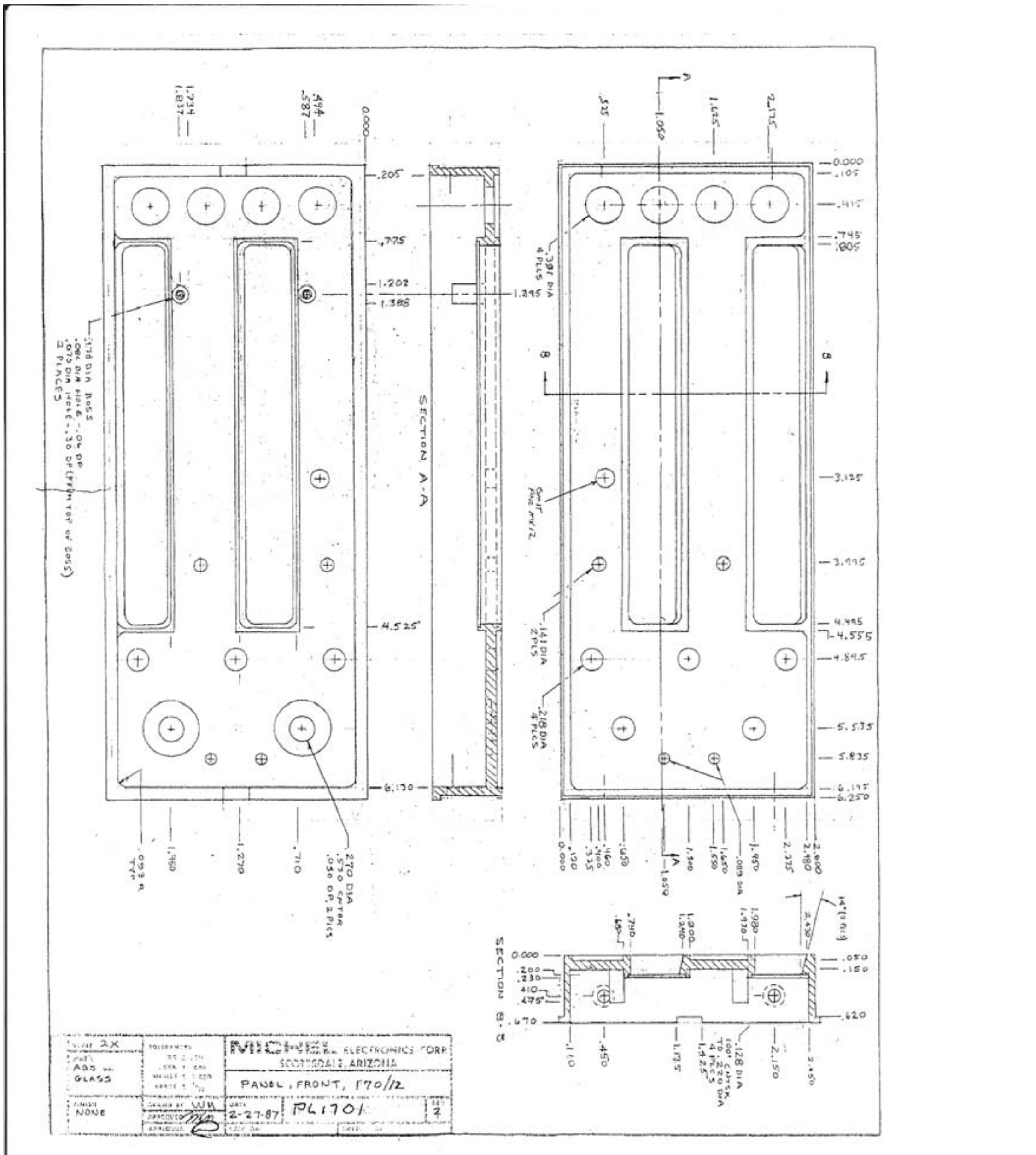
SS1740	SCALE	TOLERANCES .XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	TKM, Inc SCOTTSDALE, ARIZONA
	MAT'L		FRONT PANEL; MX170C, MX12
	FINISH	DRAWN BY WM	DATE 6-15-00 / SS1740 / REV 1
		APPROVED	
		APPROVED	USED ON / SHEET 1 OF 2

FRONT PANEL; 170B SS1740-1 page 1

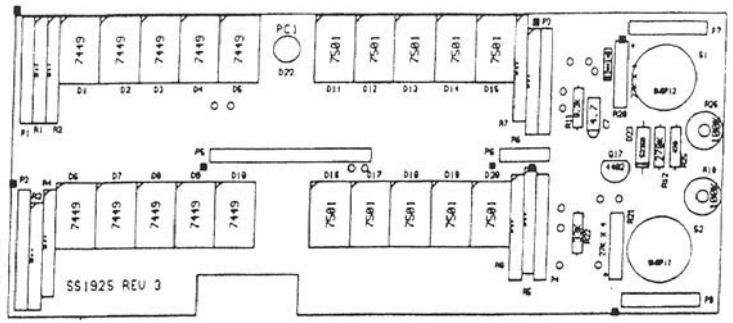
* indicates parts requiring soldermask.

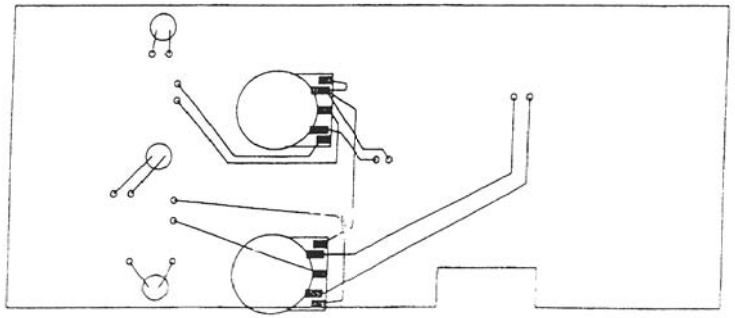
Ref #	Part #	Description	Qty
01	SS1925-3	SUB-ASSEMBLY DISPLAY; 385; 12	1
02	SS1922-4	SUB-ASSEMBLY DRIVER ASSY; 170B, 385, 12	1
03	PE1701-	FRONT PANEL MX170B	1
04	PL1777-	PLASTIC FILTER, DISPLAY, UPPER	1
05	PL1778-	PLASTIC FILTER, DISPLAY, LOWER	1
06	HM1814-1	HARDWARE; MACHINE Spacer, Front Panel	2
07	NB216P-	FASTENERS 2-56x1 PP SS	2
08	MP1800-	MISC. PARTS BUTTON; SQUARE WHT	4
09	HM1725-2	HARDWARE; MACHINE SWITCH CAP	3
10	MP1146-	MISC. PARTS KNOB CAP; 10mm BLACK	2
11	MP1046-	MISC. PARTS KNOB; 10mm BLACK	2
12	MP1245-	MISC. PARTS NUT COVER; BLACK (14.5mm)	2
13	MP1045-	MISC. PARTS KNOB; 14.5mm BLACK	2
14	MP1145-	MISC. PARTS KNOB CAP 14.5 mm	2


COMM FLIP-FLOP (increment)
SQUELCH OVERRIDE (decrement)
NAV FLIP-FLOP (insert)
VOICE/ IDENT (delete)
COMM ACTIVE
COMM STBY
COMM VOL.
25 KHz INCR.
MHz SET
TEST
VC-ID
COMM
VOL
25
MHz
MX170C
NAV ACTIVE
CLAMP 5/64" ALLEN
NAV STBY
NAV VOL
PROGRAM -VOR TEST-
NAV
VOL
VT
KHz
N-C
KHz SET
SQUELCH ADJUST
NAV-COMM SELECT
DIMMER ADJUST
TKM, Inc
SCOTTSDALE, ARIZONA
FNT PANEL ENGRAVED MX170C
PE1701
7-12-02
SCALE
MATL
FINISH
TOLERANCES
DRAWN BY WM
APPROVED
APPROVED
DATE
USED ON
REV
SHEET 1 OF 1


SECTION A-A
SECTION B-B
ELECTRONICS CORP
SCOTTSDALE, ARIZONA
PANEL, FRONT, F70/12
GLASS
NONE
2-27-87

TKM, INC. SCOTTSDALE, AZ	DISPLAY MX12,170(),MX385	PART # SS1925	REV 3
Parts Identified with "*" in parts list shall have pads solder masked. Wave soldering shall be in accordance with WSP002. Hand soldering shall be in accordance with WSP001.		DATE 12-22-2004	APPR APPR
			DRAWN BY: WM





BACKSIDE INTERCONNECT
USE #24 WIRE WITH SLEEVING.
THREE SMALL SWITCHES DO NOT
REQUIRE SLEEVING.

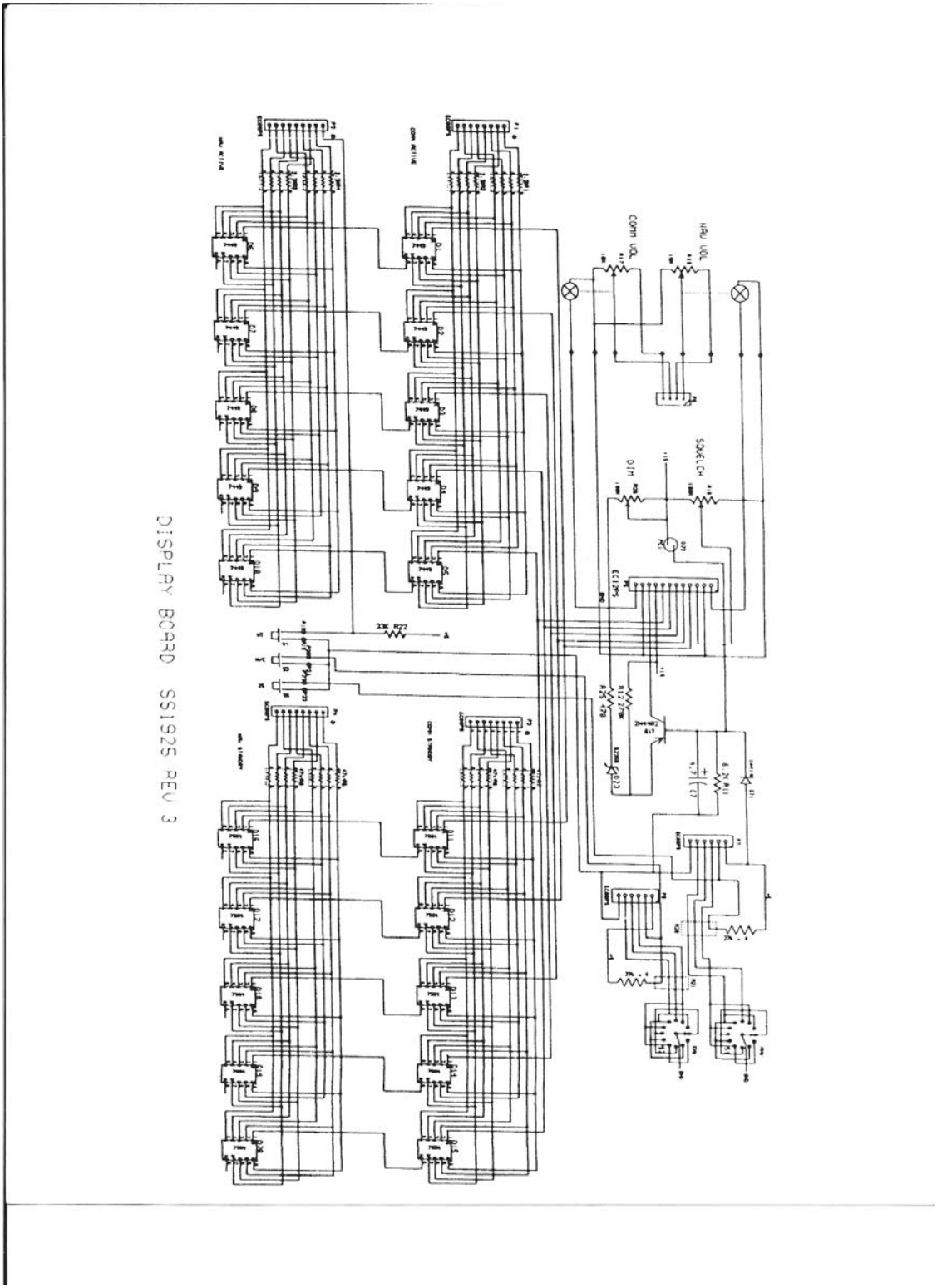
DISPLAY; 385; 12 SS1925-3 page 1

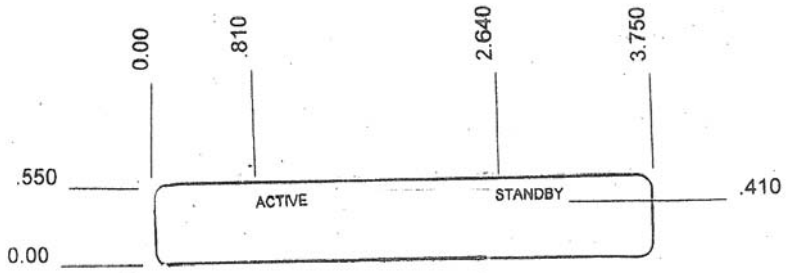
* indicates parts requiring soldermask.

Ref #	Part #	Description	Qty
01	PC1925-3	PCB DISPLAY; 170B/385/12	1
02*	HM1725-2	HARDWARE; MACHINE SWITCH CAP	3
03*	HM1814-1	HARDWARE; MACHINE Spacer, Front Panel	2
04	MP1036-	MISC. PARTS BEAD; FERRITE	1
C7	CT4751-	CAP; TANTALUM 4.7UF/20V; AXIAL	1
D1	DL7401-	OPTICAL YELLOW; 7 SEG. LED	1
D10	DL7401-	OPTICAL YELLOW; 7 SEG. LED	1
D11	DL7501-	OPTICAL RED; 7 SEGMENT LED	1
D12	DL7501-	OPTICAL RED; 7 SEGMENT LED	1
D13	DL7501-	OPTICAL RED; 7 SEGMENT LED	1
D14	DL7501-	OPTICAL RED; 7 SEGMENT LED	1
D15	DL7501-	OPTICAL RED; 7 SEGMENT LED	1
D16	DL7501-	OPTICAL RED; 7 SEGMENT LED	1
D17	DL7501-	OPTICAL RED; 7 SEGMENT LED	1
D18	DL7501-	OPTICAL RED; 7 SEGMENT LED	1
D19	DL7501-	OPTICAL RED; 7 SEGMENT LED	1
D2	DL7401-	OPTICAL YELLOW; 7 SEG. LED	1
D20	DL7501-	OPTICAL RED; 7 SEGMENT LED	1
D21	DD4148-	DIODE 1N4148	1
D22*	DD1700-	DIODE PHOTOCELL	1
D23	DD5235-	DIODE ZENER; 1N5235	1
D3	DL7401-	OPTICAL YELLOW; 7 SEG. LED	1
D4	DL7401-	OPTICAL YELLOW; 7 SEG. LED	1
D5	DL7401-	OPTICAL YELLOW; 7 SEG. LED	1
D6	DL7401-	OPTICAL YELLOW; 7 SEG. LED	1
D7	DL7401-	OPTICAL YELLOW; 7 SEG. LED	1
D8	DL7401-	OPTICAL YELLOW; 7 SEG. LED	1
D9	DL7401-	OPTICAL YELLOW; 7 SEG. LED	1
Q17	QX4403-	TRANSISTOR PNP 2N4403	1
R1	RR2204-	RESISTOR NETWORK NETWORK; 22 OHM X 4(1S0)	1
R10*	RV1803-	POT; PANEL MOUNT 10K;NAV VOLUME	1
R11	RC0822-	RESISTOR; CARB. 8.2 Kohm; 5%; 1/4 watt	1
R12	RC0274-	RESISTOR; CARB. 270K 1/4W 5%	1
R18*	PW0104-	Top Adj. .3 dia 100K	1
R2	RR2204-	RESISTOR NETWORK NETWORK; 22 OHM X 4(1S0)	1
R20	RR2734-	RESISTOR NETWORK 27K X 4	1
R21	RR2734-	RESISTOR NETWORK 27K X 4	1
R22	RC0333-	RESISTOR; CARB. 33 Kohm; 5%; 1/4 watt	1
R25	RC0471-	RESISTOR; CARB. 470 Ohm; 5%; 1/4 watt	1
R26*	PW0104-	Top Adj. .3 dia 100K	1
R3	RR2204-	RESISTOR NETWORK NETWORK; 22 OHM X 4(1S0)	1
R4	RR2204-	RESISTOR NETWORK NETWORK; 22 OHM X 4(1S0)	1
R5	RR4704-	RESISTOR NETWORK NETWORK; 47 OHM, X4(ISO)	1
R6	RR4704-	RESISTOR NETWORK NETWORK; 47 OHM, X4(ISO)	1
R7	RR4704-	RESISTOR NETWORK NETWORK; 47 OHM, X4(ISO)	1

* indicates parts requiring soldermask.

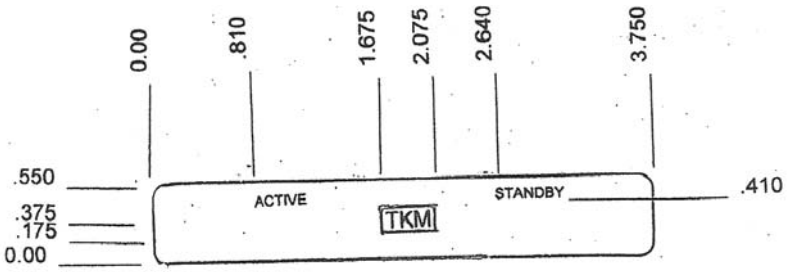
Ref #	Part #	Description	Qty
R8	RR4704-	RESISTOR NETWORK NETWORK; 47 OHM, X4(ISO)	1
R9*	RV1814-	POT; PANEL MOUNT 10K /FRONT PANEL	1
S01*	SW1700-1	SWITCHES 12 POS; ROTARY	1
S02*	SW1700-1	SWITCHES 12 POS; ROTARY	1
S03*	SW1701-	SWITCHES PUSH BUTTON; MINI	1
S04*	SW1701-	SWITCHES PUSH BUTTON; MINI	1
S05*	SW1701-	SWITCHES PUSH BUTTON; MINI	1


DISPLAY BOARD SS1925 REV 3



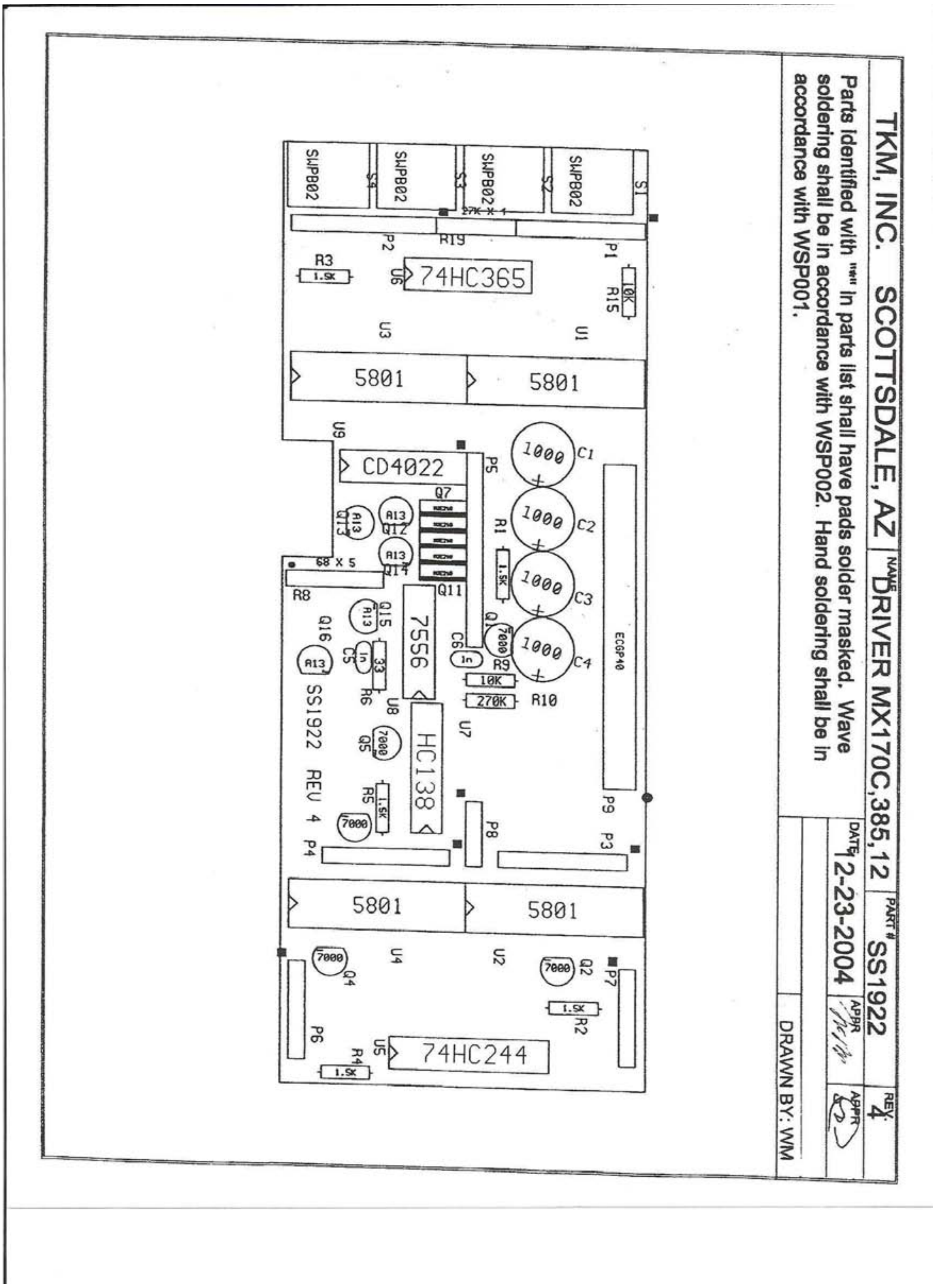
1. LETTERING TO BE PAINTED WITH GLOSS WHITE PAINT ON SCRATCH RESISTANT SURFACE.
2. LETTERING IS TO BE .060 HIGH AND BOTTOM CENTER JUSTIFIED ON INDICATED DIMENSIONS.

PL1778	SCALE	TOLERANCES .XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	TKM, Inc SCOTTSDALE, ARIZONA	
	MAT'L PANELGRAPHIC A21,PC,901AG 54 .03 THICK		PLASTIC FILTER, DISPLAY, UPPER	
	FINISH	DRAWN BY WM	DATE 12-28-02	PL1777	REV
		APPROVED			
		APPROVED	USED ON MX12, 170( ), 385	SHEET 1 OF 1	



1. LETTERING TO BE PAINTED WITH GLOSS WHITE PAINT ON SCRATCH RESISTANT SURFACE.
2. 'ACTIVE' AND 'STANDBY' TO BE .060 HIGH, 'TKM' TO BE .13 HIGH, CENTERED IN BOX.
3. LETTERING IS BOTTOM CENTER JUSTIFIED ON INDICATED DIMENSIONS.

PL1777	SCALE	TOLERANCES	TKM, Inc SCOTTSDALE, ARIZONA	
	MAT'L PANELGRAPHIC A21,PC,901AG 54 .03 THICK	.XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	PLASTIC FILTER, DISPLAY, LOWER	
	FINISH	DRAWN BY WM	DATE 12-28-02	PL1778 REV
		APPROVED	USED ON MX12, 170( ), 385	SHEET 1 OF 1
		APPROVED		


TKM, INC. SCOTTSDALE, AZ
NAME DRIVER MX170C,385,12
PART# SS1922
REV. 4
Parts identified with "*" in parts list shall have pads solder masked. Wave soldering shall be in accordance with WSP002. Hand soldering shall be in accordance with WSP001.
DATE 12-23-2004
APPR
APPR
DRAWN BY: WM
SWPB02
S1
S2
S3
S4
27K X 4
R19
P1
P2
R3
1.5K
74HC365
U6
10K
R15
U1
U3
5801
5801
U9
CD4022
P5
1000
C1
C2
C3
C4
Q7
Q11
Q12
Q13
Q14
Q15
Q16
A13
R1
1.5K
68 X 5
R8
7556
Q1
7000
C6
1n
C5
3.3
R6
R9
10K
270K
R10
ECGP40
U8
U7
HC138
Q5
R5
SS1922 REV 4
P9
P8
P3
P4
5801
5801
U4
U2
Q2
Q4
P7
P6
R2
74HC244
U5
R4

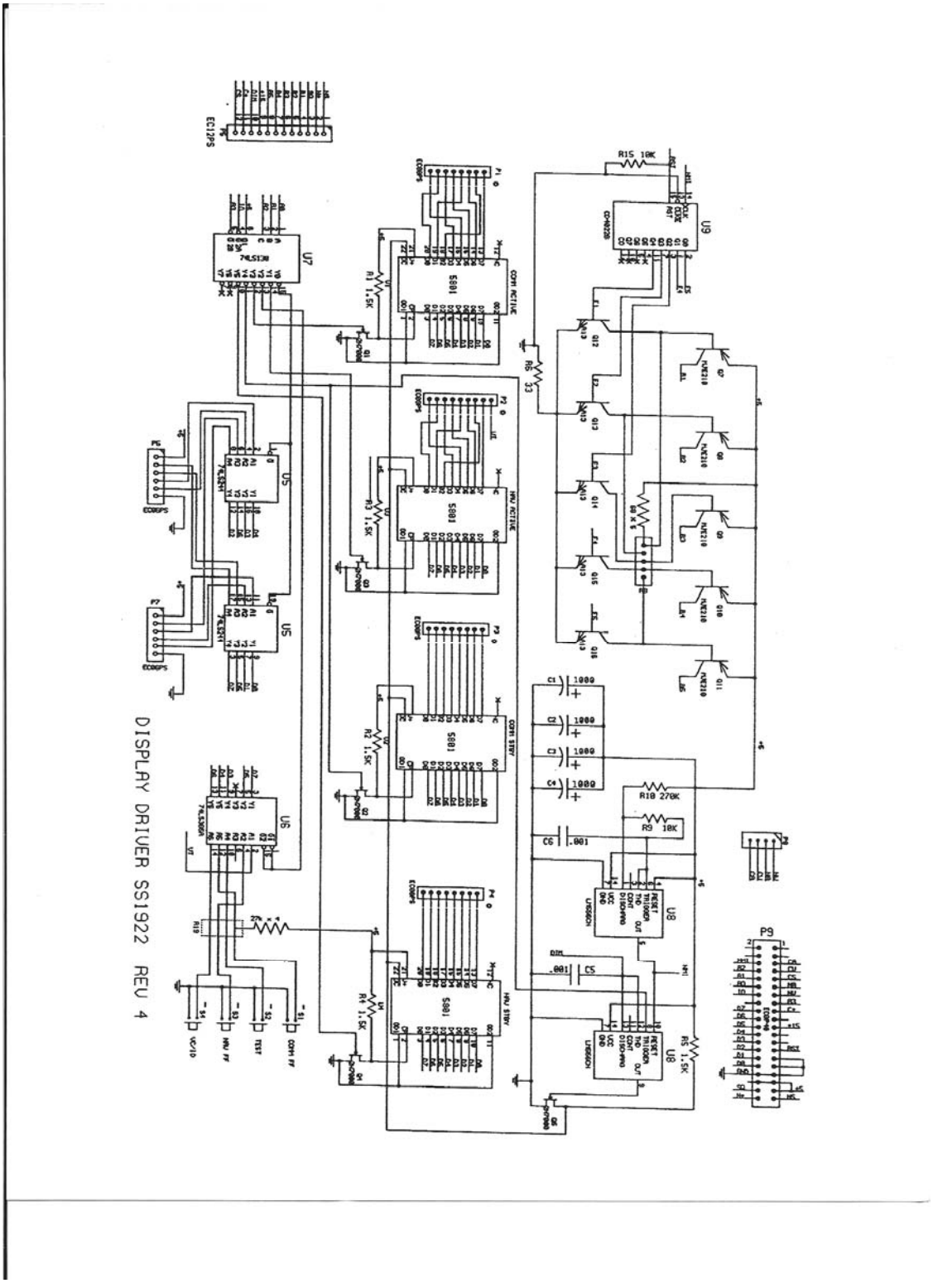
DRIVER; MX170B, 385, 12 SS1922-4 page 1

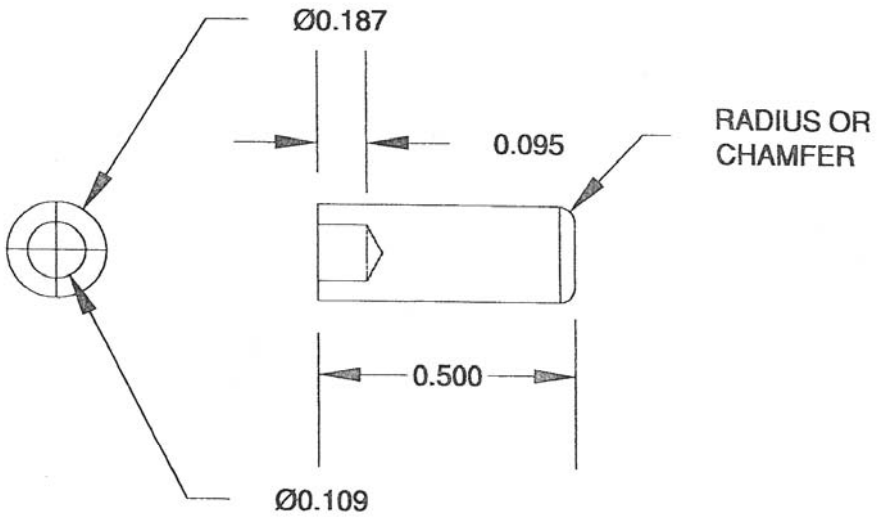
* indicates parts requiring soldermask.

Ref #	Part #	Description	Qty
	-		1
01	PC1922-4	PCB DRIVER; 170B/385/12	1
02	ES1002-	IC SOCKET; DIP 14 PIN; DIP	1
03	ES1004-	IC SOCKET; DIP 20 PIN; DIP	1
04*	MP1801-	MISC. PARTS SWITCH CAP; ROUND/WHT	4
05*	HS1814-	SPACER FRONT PANEL;SPACER	2
C1	CE1081-	CAP; ALUM ELECT. 1000/6.3-10V; RADIAL	1
C2	CE1081-	CAP; ALUM ELECT. 1000/6.3-10V; RADIAL	1
C3	CE1081-	CAP; ALUM ELECT. 1000/6.3-10V; RADIAL	1
C4	CE1081-	CAP; ALUM ELECT. 1000/6.3-10V; RADIAL	1
C5	CR1024-	CAP; MONO-CERAMIC .001uF; 100V	1
C6	CR1024-	CAP; MONO-CERAMIC .001uF; 100V	1
P1	MP1043-	MISC. PARTS SOCKET STRIP; GOLD	1
P2	MP1043-	MISC. PARTS SOCKET STRIP; GOLD	1
P3	MP1043-	MISC. PARTS SOCKET STRIP; GOLD	1
P4	MP1043-	MISC. PARTS SOCKET STRIP; GOLD	1
P5	MP1043-	MISC. PARTS SOCKET STRIP; GOLD	1
P6	MP1043-	MISC. PARTS SOCKET STRIP; GOLD	1
P7	MP1043-	MISC. PARTS SOCKET STRIP; GOLD	1
P8	MP1043-	MISC. PARTS SOCKET STRIP; GOLD	1
P9	MP1053-	MISC. PARTS PIN HEADERS; GOLD; DUAL ROW	1
Q1	QX7000-	TRANSISTOR 2N7000	1
Q10*	QX0210-	TRANSISTOR MJE210	1
Q11*	QX0210-	TRANSISTOR MJE210	1
Q12	QX0A13-	TRANSISTOR MPSA13	1
Q13	QX0A13-	TRANSISTOR MPSA13	1
Q14	QX0A13-	TRANSISTOR MPSA13	1
Q15	QX0A13-	TRANSISTOR MPSA13	1
Q16	QX0A13-	TRANSISTOR MPSA13	1
Q2	QX7000-	TRANSISTOR 2N7000	1
Q3	QX7000-	TRANSISTOR 2N7000	1
Q4	QX7000-	TRANSISTOR 2N7000	1
Q5	QX7000-	TRANSISTOR 2N7000	1
Q7	QX0210-	TRANSISTOR MJE210	1
Q8	QX0210-	TRANSISTOR MJE210	1
Q9	QX0210-	TRANSISTOR MJE210	1
R1	RC0152-	RESISTOR; CARB. 1.5 Kohm; 5%; 1/4 watt	1
R10	RC0274-	RESISTOR; CARB. 270K 1/4W 5%	1
R15	RC0103-	RESISTOR; CARB. 10 Kohm; 5%; 1/4 watt	1
R19	RR2734-	RESISTOR NETWORK 27K X 4	1
R2	RC0152-	RESISTOR; CARB. 1.5 Kohm; 5%; 1/4 watt	1
R3	RC0152-	RESISTOR; CARB. 1.5 Kohm; 5%; 1/4 watt	1
R4	RC0152-	RESISTOR; CARB. 1.5 Kohm; 5%; 1/4 watt	1
R5	RC0152-	RESISTOR; CARB. 1.5 Kohm; 5%; 1/4 watt	1
R6	RC0330-	RESISTOR; CARB. 33 OHM; 1/4W 5%	1

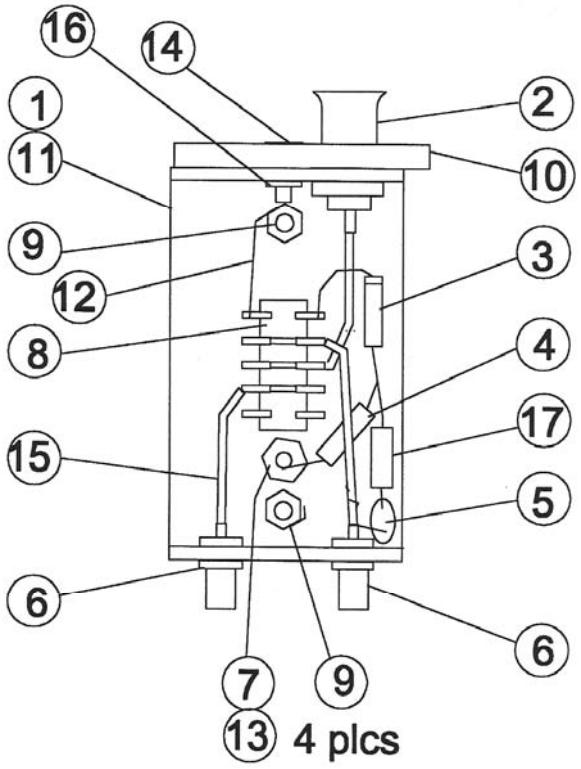
* indicates parts requiring soldermask.

Ref #	Part #	Description	Qty
R8	RR8201-	RESISTOR NETWORK 82 OHM X 5	1
R9	RC0103-	RESISTOR; CARB. 10 Kohm; 5%; 1/4 watt	1
S1*	SW1800-	SWITCHES PUSH BUTTON	1
S2*	SW1800-	SWITCHES PUSH BUTTON	1
S3*	SW1800-	SWITCHES PUSH BUTTON	1
S4*	SW1800-	SWITCHES PUSH BUTTON	1
U1	IM5801-	INT. CKT.; MISC. UCN5801	1
U2	IM5801-	INT. CKT.; MISC. UCN5801	1
U3	IM5801-	INT. CKT.; MISC. UCN5801	1
U4	IM5801-	INT. CKT.; MISC. UCN5801	1
U5*	IH7644-	INT. CKT.; HI SPEED CMOS 74HC244	1
U6	IH7765-	INT. CKT.; HI SPEED CMOS	1
U7	IH7538-	INT. CKT.; HI SPEED CMOS 74HC138	1
U8*	IM7556-	INT. CKT.; MISC. 7556	1
U9	IC4022-	INT. CKT; CMOS 14022	1


DISPLAY DRIVER SS1922 REV 4



HM1725	SCALE	TOLERANCES .XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L NYLON ROD WHITE		CAP, SWITCH		
	FINISH NONE	DRAWN BY WM APPROVED APPROVED	DATE 8-28-00	HM1725	REV 2
			USED ON	SHEET 1 OF 1	



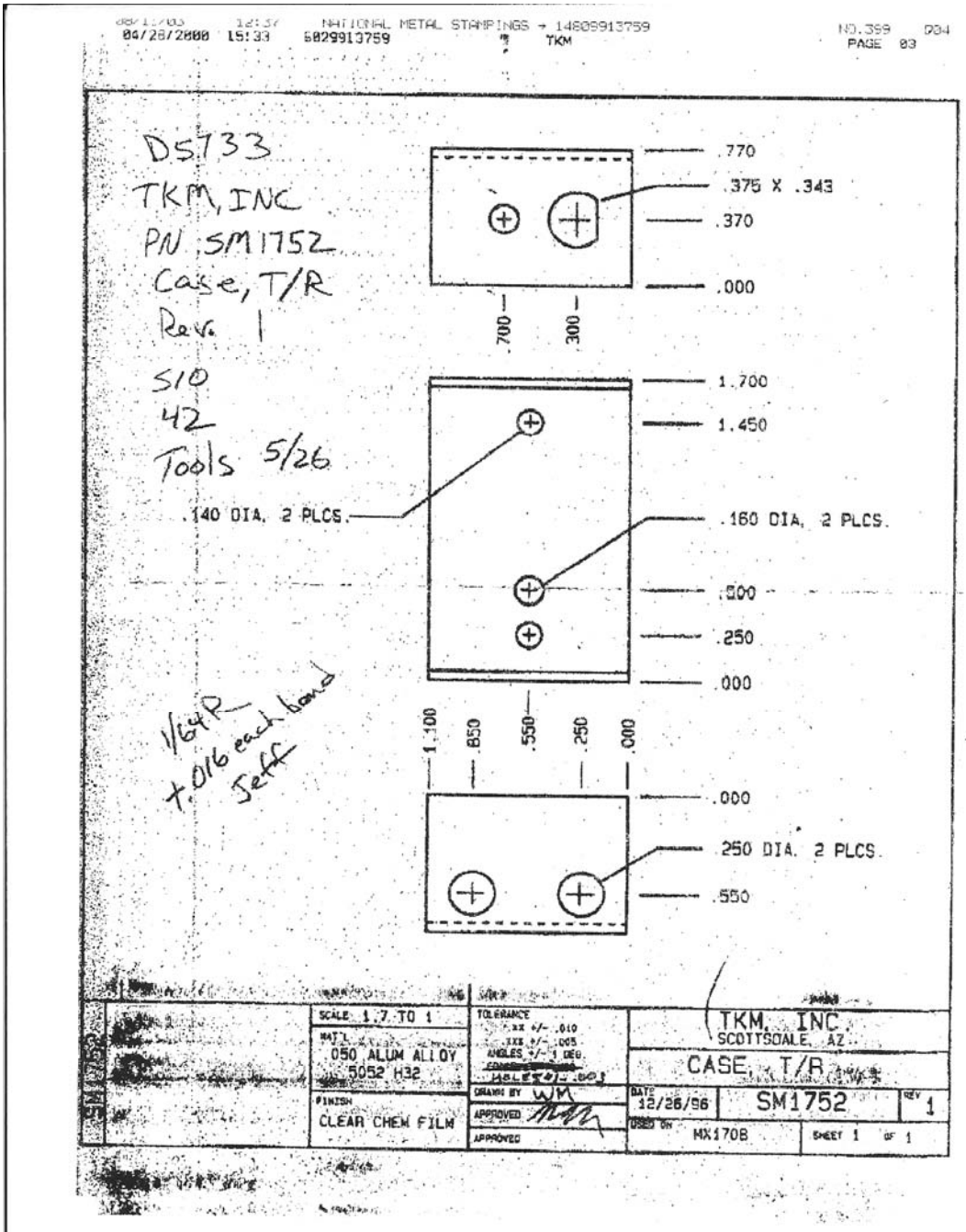
SOLDERING SHALL BE IN ACCRDANCE
WITH DOCUMENT WSP001

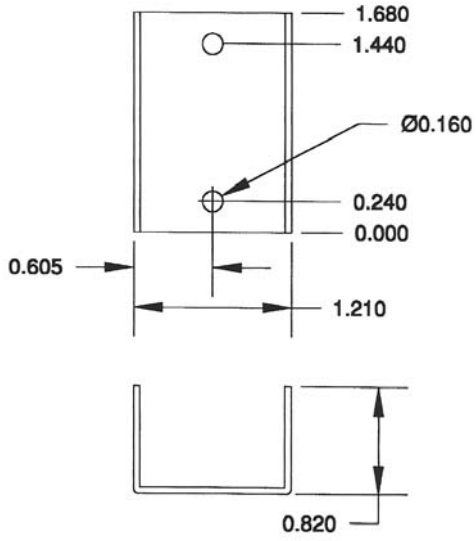
SS1731	SCALE	TOLERANCES .XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L		SWITCH, T/R,MX170C		
	FINISH	DRAWN BY WM	DATE 7-21-00	SS1731	REV 5
		APPROVED			
		APPROVED	USED ON	SHEET 1 OF 1	

T/R SWITCH; MX170B SS1731-5 page 1

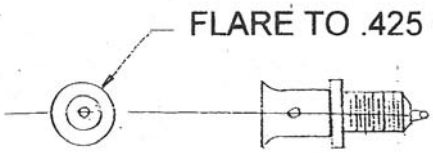
* indicates parts requiring soldermask.

Ref #	Part #	Description	Qty
01	SM1752-1	SHEET METAL CASE; T/R MX170B	1
02	EC1022-	CONNECTOR COAX CONN; UG/1094; SHORT	1
03	DD4148-	DIODE 1N4148	1
04	LF01R0-	INDUCTOR; FIXED 1.0 uH AXIAL	1
05	CR2R73-	CAP; MONO-CERAMIC 2.7 Pf; 200V; Radial	1
06	EC1703-	CONNECTOR CONN; SMA; PANEL MT.	2
07	CD1023-	CAPACITOR; FEED THRU 1000 pF	1
08	KA1804-	RELAY 9V T/R RELAY	1
09	HS1816-2	SPACER STANDOFF; 4-40 THD	2
10	HM1751-3	HARDWARE; MACHINE 170B T/R MTG BLOCK	1
11	SM1753-	SHEET METAL COVER; T/R MX170B	1
12	WI24BR-	WIRE 24 AWG BUS WIRE	1
13	NB403P-	FASTENERS 4-40x3/16 PP SS	4
14	NB404F-	FASTENERS 4-40x1/4 P100 SS	1
15	WI20BR-	WIRE 20 AWG BUS WIRE	3
16	NB400I-	FASTENERS INSERT; EXTENDED	1
17	RC0332-	RESISTOR; CARB. 3.3 Kohm; 5%; 1/4 watt	0


08/28/2000 15:33 8029913759 NATIONAL METAL STAMPINGS → 14809913759 TKM
NO.399 004
PAGE 03
D5733
TKM, INC
PN: SM1752
Case, T/R
Rev. 1
S10
42
Tools 5/26
.140 DIA. 2 PLCS.
1/64R
+.016 each hand
Jeff
.770
.375 X .343
.370
.000
.700
.300
1.700
1.450
.160 DIA. 2 PLCS.
.500
.250
.000
1.100
.850
.550
.250
.000
.000
.250 DIA. 2 PLCS.
.550
SCALE 1.7 TO 1
MATL 050 ALUM ALLOY 5052 H32
FINISH CLEAR CHEM FILM
TOLERANCE .XX +/- .010 .XXX +/- .005 ANGLES +/- 1 DEG.
DRAWN BY WM
APPROVED
APPROVED
TKM, INC SCOTTSDALE, AZ
CASE, T/R
DATE 12/26/96
SM1752
REV 1
USED ON MX1708
SHEET 1 OF 1

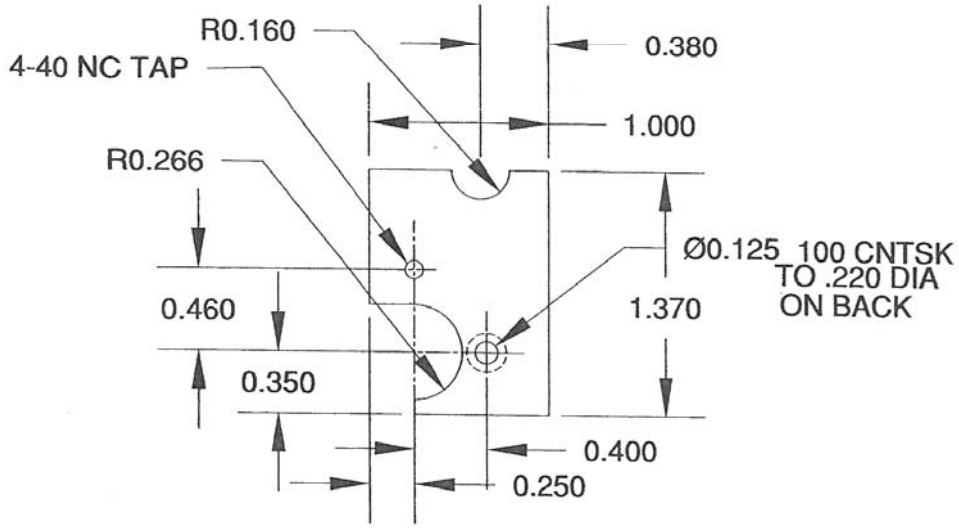


SM1753	SCALE	TOLERANCES .XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG HOLES +/- .003	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L .050 5052 H32		COVER,T/R		
	FINISH CLR CHEM FILM MIL-C-5541	DRAWN BY WM APPROVED APPROVED	DATE 8-9-99	SM1753	REV
			USED ON MX170B	SHEET 1 OF 1	



NOTE: USE UG 1094 A/U SHORT

EC1022	SCALE	TOLERANCES	MICHEL avionics prods. SCOTTSDALE, ARIZONA		
	MAT'L		COAX, FLARED		
	FINISH	DRAWN BY WD.	DATE 3/25/94	EC1022	REV
		APPROVED			
		APPROVED	USED ON MX170( ), MX385	SHEET OF	

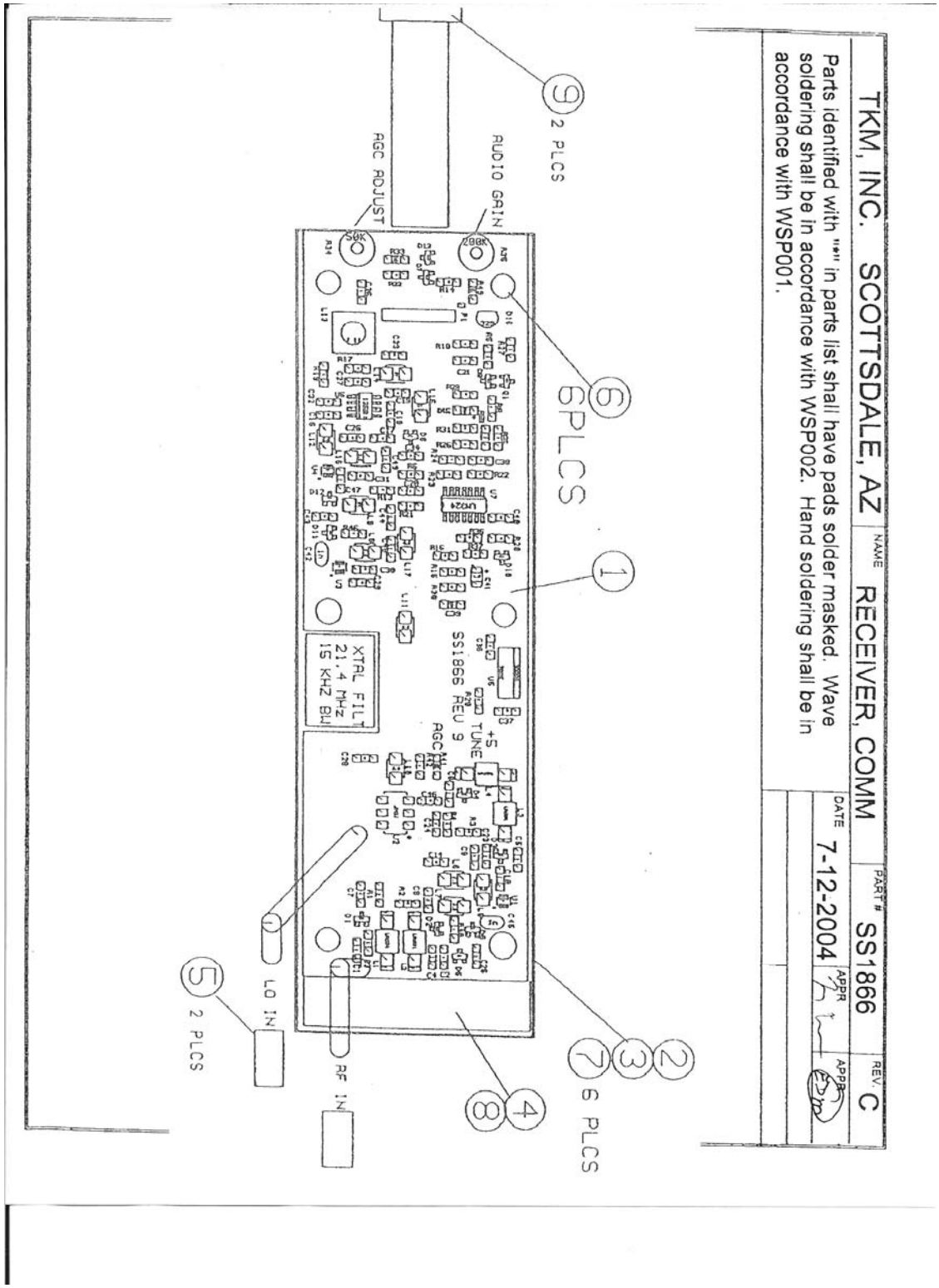


HM1751	SCALE	TOLERANCES	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L . .140 ALUM 5052 H32	.XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	MTG. BLOCK, T/R		
	FINISH CLR CHEM FILM MIL-C-5541	~~DRAWN BY WM~~ APPROVED APPROVED	DATE 3-1-00	HM1751	REV 3
			USED ON	SHEET 1 OF 1	

INDENTURED DRAWING LIST

MODULE SS1866 – COMM RECEIVER

SS1866	REV C	RECEIVER ASSY; COMM (GREEN)
PC1866	REV C	PCB, RECEIVER
SM1840	REV 3	CASE, MODULE
SM1841	REV 3	COVER, MODULE
SM1812	REV 2	GND BRACKET; RX
CA1803	NONE	CABLE ASSY, COAX
CA1866	NONE	CABLE, COMM RECEIVER
CA1804	REV 1	CABLE ASSY, COAX
LFST4N	NONE	INDUCTOR, RF
LFST5N	NONE	INDUCTOR, RF


TKM, INC. SCOTTSDALE, AZ
NAME RECEIVER, COMM
PART # SS1866
REV. C
DATE 7-12-2004
APPR
APPR
Parts identified with "*" in parts list shall have pads solder masked. Wave soldering shall be in accordance with WSP002. Hand soldering shall be in accordance with WSP001.
9 2 PLCS
AGC ADJUST
AUDIO GAIN
5 6PLCS
1
2 3 7 6 PLCS
4 8
5 2 PLCS
LO IN
RF IN
XTAL FIL 21.4 MHZ 15 KHZ BW
SS1866 REV 9
TUNE
+S
AGC

RECEIVER; COMM (GREEN) SS1866-C page 1

* indicates parts requiring soldermask.

Ref #	Part #	Description	Qty
01	PC1866-C	PCB RECEIVER; COMM-GREEN, NAV-BLUE	1
02*	HS1816-2	SPACER STANDOFF; 4-40 THD	6
03*	SM1840-3	SHEET METAL CASE; MODULE	1
04*	SM1841-3	SHEET METAL COVER; MODULE	1
05*	SM1812-2	SHEET METAL GND BRACKET; RX	1
06*	MP1044-	MISC. PARTS PIN HEADER; GOLD; SINGLE	1
07*	CA1803-	CABLE; RIBBON ASSEMBLY,COAX CONN RG188	2
08*	EC1709-	CONNECTOR HOUSING; 6 PIN	2
09*	EC1806-	CONNECTOR CRIMP PINS; SMALL	5
10*	NB403F-	FASTENERS 4-40x3/16 P100 SS	6
11*	NB404S-	FASTENERS #4 X 1/4 SS Sheet Metal	1
12*	CA1866-	CABLE; RIBBON RECEIVER,COMM 6 COND.	1
13*	CA1804-	CABLE; RIBBON COAX ASSY CABLE	0
C1	CS05R6-	CAP; SMT; CER; 5.6pF; 100V; 1206	1
C10	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C14	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C16	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C17	CS0103-	CAP; SMT; CER; .01 uF; 100V; 1206	1
C18	CS0103-	CAP; SMT; CER; .01 uF; 100V; 1206	1
C19	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C2	CS05R6-	CAP; SMT; CER; 5.6pF; 100V; 1206	1
C20	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C21	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C23	CS0101-	CAP; SMT; CER; 100PF; 100V; 1206	1
C24	CS0101-	CAP; SMT; CER; 100PF; 100V; 1206	1
C25	CS0150-	CAP; SMT; CER; 15pf; 100V; 1206	1
C26	CS0150-	CAP; SMT; CER; 15pf; 100V; 1206	1
C27	CS0270-	CAP; SMT; CER; 27 PF; 50V; 1206	1
C28	CS0270-	CAP; SMT; CER; 27 PF; 50V; 1206	1
C29	CS0270-	CAP; SMT; CER; 27 PF; 50V; 1206	1
C3	CS0150-	CAP; SMT; CER; 15pf; 100V; 1206	1
C30	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C31	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C32	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C33	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C34	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C35	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C36	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C37	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C38	CS0472-	CAP; SMT; CER; .0047; 100V; 1206	1
C39	CS0333-	CAP; SMT; CER; .033 uF; 100V; 1206	1
C4	CS0150-	CAP; SMT; CER; 15pf; 100V; 1206	1
C40	CS0103-	CAP; SMT; CER; .01 uF; 100V; 1206	1
C41	CX0105-	CAP; SMT; TANT 1.0 uF; 35 V	1
C42	C60102-	CAP; SM; 1000 Pf	1

* indicates parts requiring soldermask.

Ref #	Part #	Description	Qty
C43	CS0150-	CAP; SMT; CER; 15pf; 100V; 1206	1
C44	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C45*	CR1024-	CAP; MONO-CERAMIC .001uF; 100V	1
C46	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C47	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C48	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C49	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C5	CS0150-	CAP; SMT; CER; 15pf; 100V; 1206	1
C6	CS0150-	CAP; SMT; CER; 15pf; 100V; 1206	1
C7	CS0181-	CAP; SMT; CER; 180PF; 100V; 1206	1
C8	CS0181-	CAP; SMT; CER; 180PF; 100V; 1206	1
C9	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
D1	DS0109-	DIODE; SMT MMBV109	1
D10	DS0016-	DIODE; SMT SWITCHING	1
D11	DS3401-	DIODE; SMT MMBV3401	1
D12	DS3401-	DIODE; SMT MMBV3401	1
D13	DS0101-	DIODE; SMT MMBD101	1
D15	DS5230-	DIODE; SMT 1N5230; SMT	1
D16*	DD0329-	DIODE LM329	1
D2	DS0109-	DIODE; SMT MMBV109	1
D3	DS0109-	DIODE; SMT MMBV109	1
D4	DS0109-	DIODE; SMT MMBV109	1
D5	DS3401-	DIODE; SMT MMBV3401	1
D6	DS3401-	DIODE; SMT MMBV3401	1
D7	DS0101-	DIODE; SMT MMBD101	1
D8	DS0101-	DIODE; SMT MMBD101	1
D9	DS0016-	DIODE; SMT SWITCHING	1
L09	LS0270-	IND; FIXED; SMT 27 uH; 10% SMT	1
L1*	LFS4TN-	INDUCTOR; FIXED	0
L10	LS02R2-	IND; FIXED; SMT 2.2 uH; 10%; SMT	1
L11	LS02R2-	IND; FIXED; SMT 2.2 uH; 10%; SMT	1
L12	LS02R2-	IND; FIXED; SMT 2.2 uH; 10%; SMT	1
L13*	LA1701-	COIL/COILFORM 3.3 uH; RX	1
L14	LS0270-	IND; FIXED; SMT 27 uH; 10% SMT	1
L15	LS0270-	IND; FIXED; SMT 27 uH; 10% SMT	1
L16	LS03R3-	IND; FIXED; SMT 3.3 uH; 10%; SMT	1
L17	LS03R3-	IND; FIXED; SMT 3.3 uH; 10%; SMT	1
L19	LS03R3-	IND; FIXED; SMT 3.3 uH; 10%; SMT	1
L2*	LFS4TN-	INDUCTOR; FIXED	0
L20	LS03R3-	IND; FIXED; SMT 3.3 uH; 10%; SMT	1
L3*	LFS5TN-	INDUCTOR; FIXED	0
L4*	LFS5TN-	INDUCTOR; FIXED	0
L5	LS03R3-	IND; FIXED; SMT 3.3 uH; 10%; SMT	1
L6	LS03R3-	IND; FIXED; SMT 3.3 uH; 10%; SMT	1

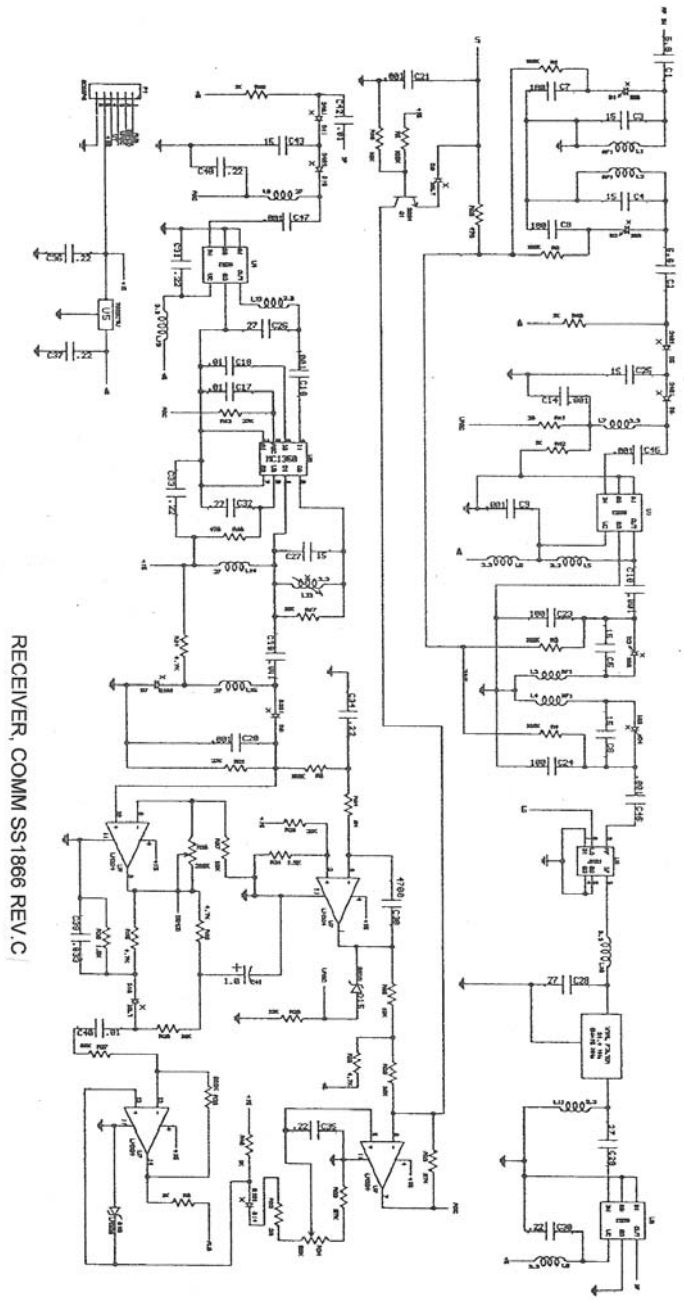
* indicates parts requiring soldermask.

Ref #	Part #	Description	Qty
L7	LS03R3-	IND; FIXED; SMT 3.3 uH; 10%; SMT	1
L8	LS03R3-	IND; FIXED; SMT 3.3 uH; 10%; SMT	1
Q1	QS3904-	TRANSISTOR; SMT MMBT3904	1
R1	RS0104-	RES; SMT; FILM; 100K; 1/4W 5%;1206	1
R13	RS0273-	RES; SMT; FILM; 27K; 1/4W 5%; 1206	1
R14	RS0472-	RES; SMT; FILM; 4.7K; 1/4W 5%; 1206	1
R15	RS0472-	RES; SMT; FILM; 4.7K; 1/4W 5%; 1206	1
R16	RS0472-	RES; SMT; FILM; 4.7K; 1/4W 5%; 1206	1
R17	RS0473-	RES; SMT; FILM; 47K; 1/4W 5%; 1206	1
R18	RS0183-	RES; SMT; FILM; 18K; 1/4W 5%; 1206	1
R19	RS0471-	RES; SMT; FILM; 470 OHM; 1/4W 5%; 1206	1
R2	RS0104-	RES; SMT; FILM; 100K; 1/4W 5%;1206	1
R20	RS0471-	RES; SMT; FILM; 470 OHM; 1/4W 5%; 1206	1
R21	RS0273-	RES; SMT; FILM; 27K; 1/4W 5%; 1206	1
R22	RS0183-	RES; SMT; FILM; 18K; 1/4W 5%; 1206	1
R23	RS0273-	RES; SMT; FILM; 27K; 1/4W 5%; 1206	1
R24	RS0105-	RES; SMT; FILM; 1 MEG; 1/4W 5%; 1206	1
R25	RS0123-	RES; SMT; FILM; 12K; 1/4W 5%; 1206	1
R26	RS3922-	RES; SMT; FILM; 39.2K; 1/4W 5%; 1206	1
R27	RS0103-	RES; SMT; FILM; 10K; 1/4W 5%; 1206	1
R28	RS0103-	RES; SMT; FILM; 10K; 1/4W 5%; 1206	1
R29	RS0472-	RES; SMT; FILM; 4.7K; 1/4W 5%; 1206	1
R3	RS0104-	RES; SMT; FILM; 100K; 1/4W 5%;1206	1
R30	RS0152-	RES; SMT; FILM; 1.5K; 1/4W 5%; 1206	1
R31	RS0152-	RES; SMT; FILM; 1.5K; 1/4W 5%; 1206	1
R32	RS0273-	RES; SMT; FILM; 27K; 1/4W 5%; 1206	1
R33	RS0390-	RES; SMT; FILM; 39 OHM; 1/4W 5%; 1206	1
R34*	PW0503-	Top Adj. .3 dia 50K	1
R35*	PW0204-	Top Adj. .3 dia 200K	1
R36	RS0684-	RES; SMT; FILM; 680K; 1/4W 5%; 1206	1
R37	RS0683-	RES; SMT; FILM; 68K; 1/4W 5%; 1206	1
R4	RS0104-	RES; SMT; FILM; 100K; 1/4W 5%;1206	1
R40	RS0102-	RES; SMT; FILM; 1K; 1/4W 5%; 1206	1
R41	RS0390-	RES; SMT; FILM; 39 OHM; 1/4W 5%; 1206	1
R42	RS0102-	RES; SMT; FILM; 1K; 1/4W 5%; 1206	1
R46	RS0102-	RES; SMT; FILM; 1K; 1/4W 5%; 1206	1
R49	RS0102-	RES; SMT; FILM; 1K; 1/4W 5%; 1206	1
R5	RS0104-	RES; SMT; FILM; 100K; 1/4W 5%;1206	1
R50	RS0472-	RES; SMT; FILM; 4.7K; 1/4W 5%; 1206	1
R6	RS0104-	RES; SMT; FILM; 100K; 1/4W 5%;1206	1
R8	RS0102-	RES; SMT; FILM; 1K; 1/4W 5%; 1206	1
U1	IS0052-	INT. CKT.; SMT 52063	1
U2	ISADE1-	INT. CKT.; SMT Mixer; 500 MHz	1
U3	IS0052-	INT. CKT.; SMT 52063	1

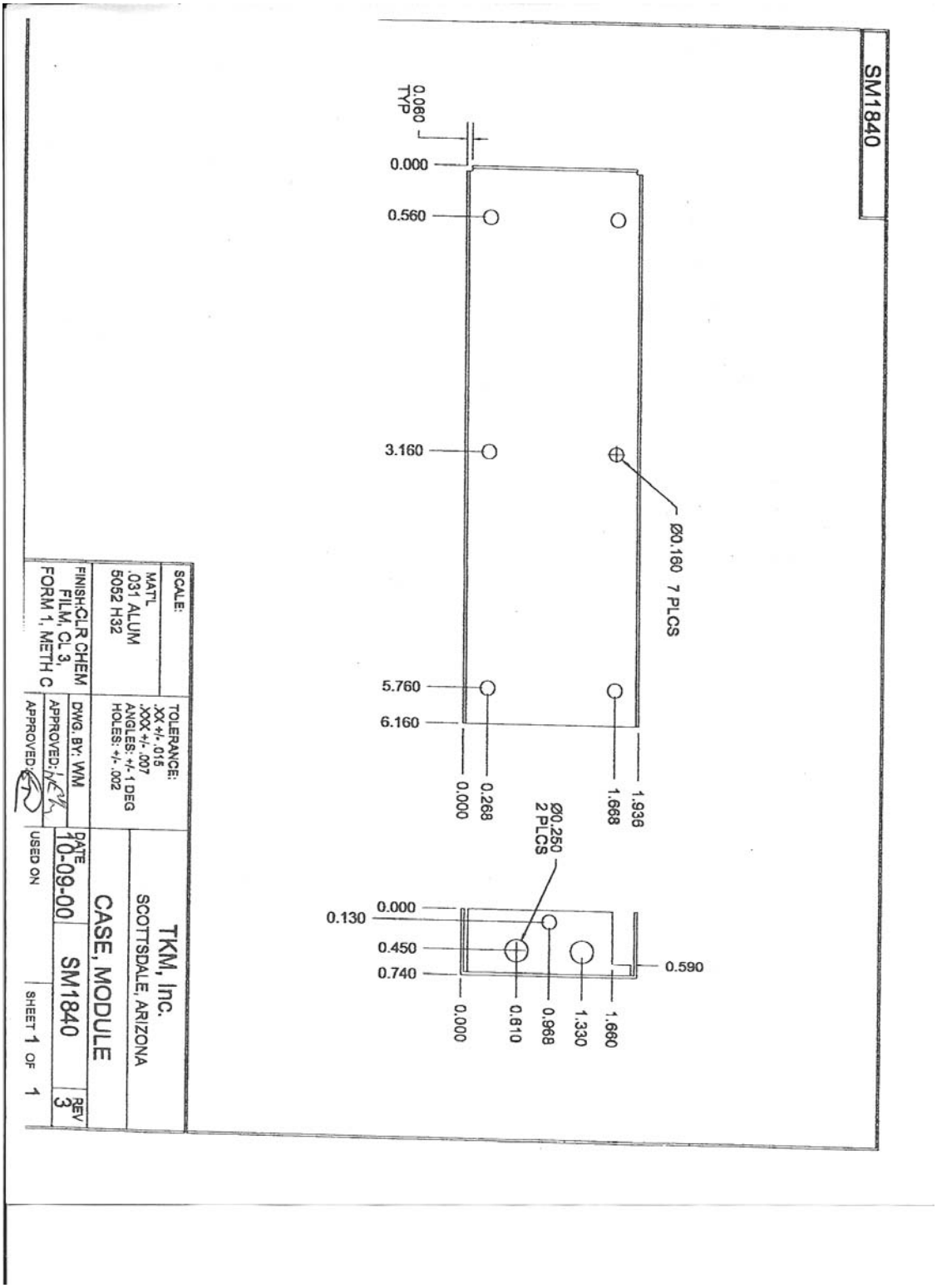
RECEIVER; COMM (GREEN) SS1866-C page 4

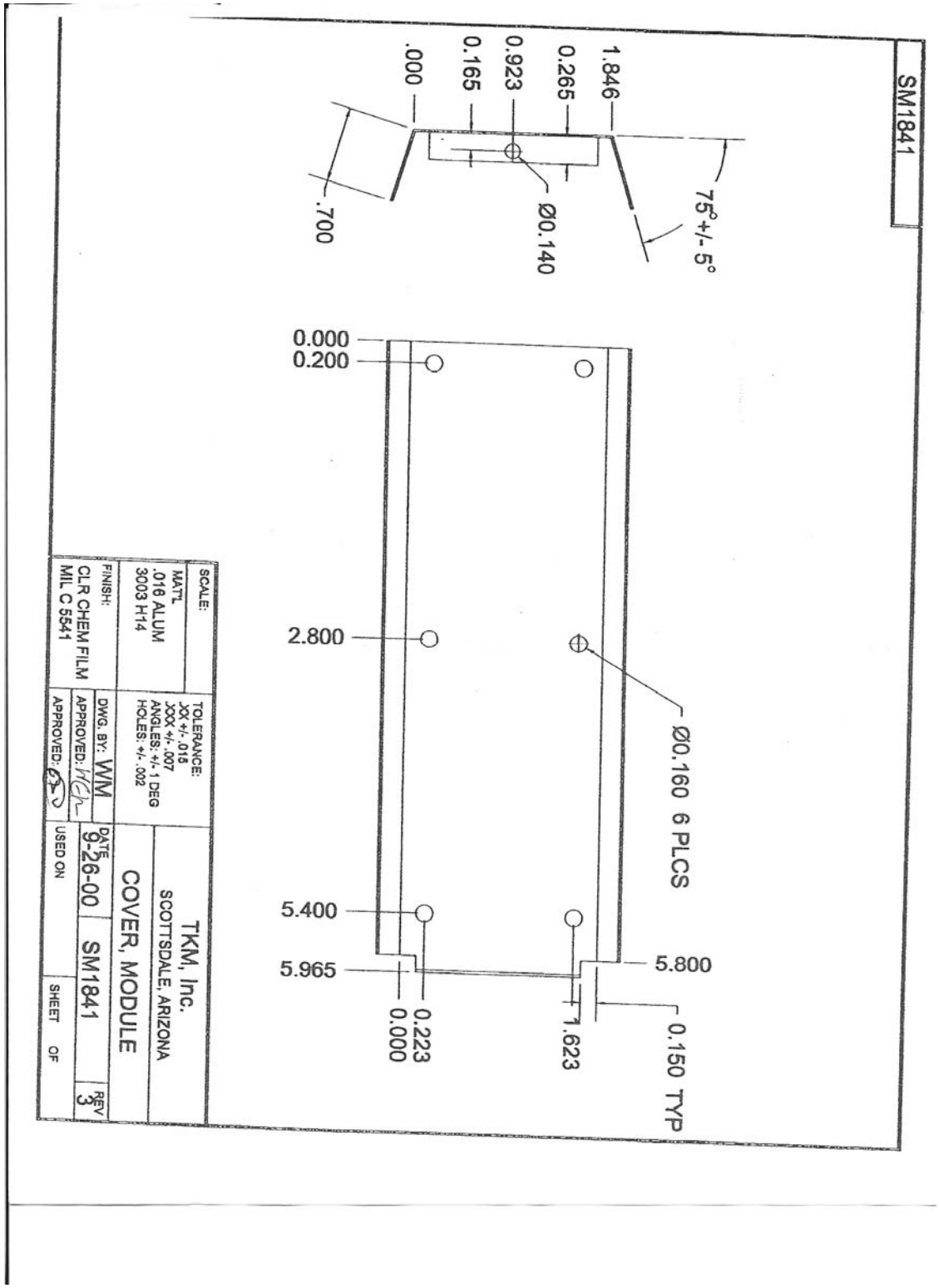
* indicates parts requiring soldermask.

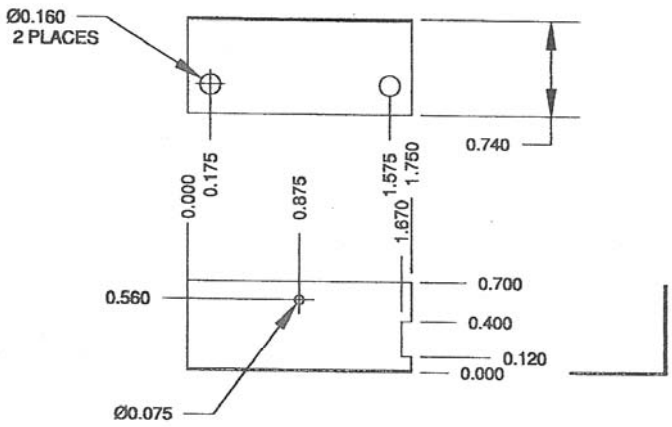
Ref #	Part #	Description	Qty
U4	IS0052-	INT. CKT.; SMT 52063	1
U5*	IM7805-	INT. CKT.; MISC. REGULATOR; 5V 7805	1
U6	IS1350-	INT. CKT.; SMT 1350; SMT	1
U7	IS0324-	INT. CKT.; SMT LM324; SMT	1
X1*	XT2115-	CRYSTAL; QUARTZ FILTER; COMM 15 KHZ	1



RECEIVER, COMM SS1866 REV.C

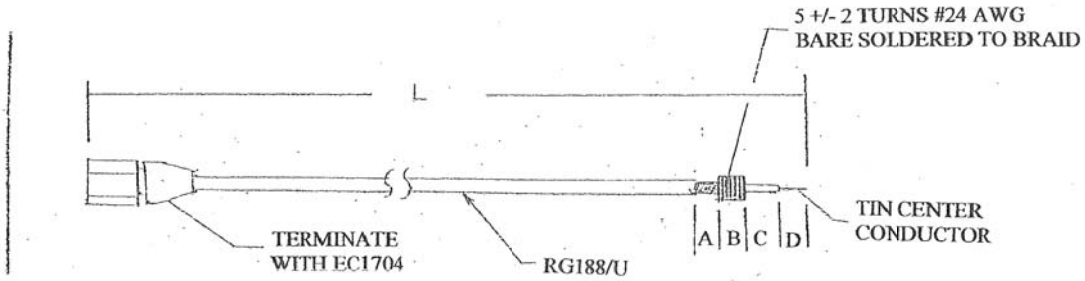

SM1840
0.060 TYP
0.000
0.560
3.160
5.760
6.160
Ø0.160 7 PLCS
0.000
0.268
1.668
1.936
Ø0.250 2 PLCS
0.130
0.000
0.450
0.740
0.590
0.000
0.810
0.968
1.330
1.660
SCALE:
MAT'L .031 ALUM 5052 H32
TOLERANCE: .XX +/- .015 .XXX +/- .007 ANGLES: +/- 1 DEG HOLES: +/- .002
FINISH: CLR CHEM FILM, CL 3, FORM 1, METH C
DWG. BY: WM
APPROVED:
APPROVED:
DATE 10-09-00
TKM, Inc.
SCOTTSDALE, ARIZONA
CASE, MODULE
SM1840
REV 3
USED ON
SHEET 1 OF 1


SM1841
1.846
0.265
0.923
0.165
.000
.700
Ø0.140
75° +/- 5°
0.000
0.200
2.800
5.400
5.965
Ø0.160 6 PLCS
5.800
0.223
0.000
1.623
0.150 TYP
SCALE:
MATL
.016 ALUM
3003 H14
TOLERANCE:
XX +/- .015
XXX +/- .007
ANGLES: +/- 1 DEG
HOLES: +/- .002
FINISH:
CLR CHEM FILM
MIL C 5541
DWG. BY: WM
APPROVED:
APPROVED:
TKM, Inc.
SCOTTSDALE, ARIZONA
COVER, MODULE
DATE
9-26-00
SM1841
REV
3
USED ON
SHEET OF



SM1812	SCALE	TOLERANCES .XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG FRACT +/- 1/32	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L HALF HARD BRASS		BRACKET, GROUNDING		
	FINISH BRIGHT TIN	DRAWN BY WM APPROVED WM APPROVED	DATE 8-9-99	SM1812	REV 2
			USED ON	SHEET 1 OF 1	

CA1803



NOTES:

DIMENSION(OPEN END)

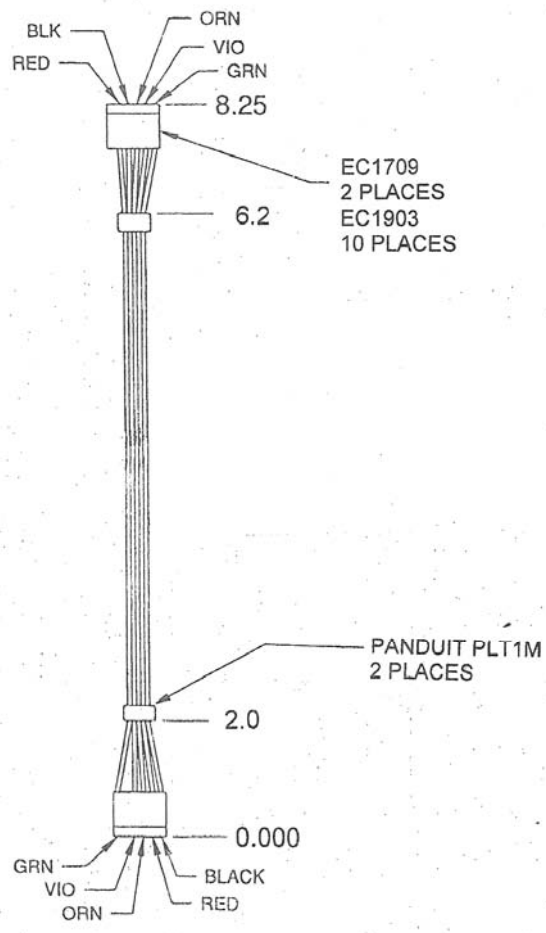
A = .600 +/- .02
B = .100 +/- .02
C = .240 +/- .20
D = .220 +/- .20

DIMENSION(TERMINATED END)

A = .640 +/- .02
B = .140 +/- .02
C = .200 +/- .02
D = .220 +/- .02

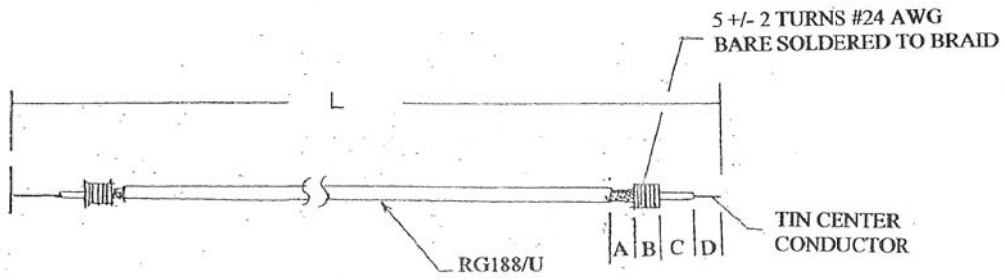
L = 7.50 =/- .040

SCALE:	TOLERANCE:	TKM, Inc. SCOTTSDALE, ARIZONA	
MAT'L		CABLE ASSY, COAX	
FINISH:	DWG. BY: WM	DATE 5-10-94 CA1803	REV
	APPROVED:	USED ON SS1866 SS1867	SHEET 1 OF 1
	APPROVED:		



CA1866	SCALE	TOLERANCES .XX +/- .030 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	TKM, Inc SCOTTSDALE, ARIZONA	
	MAT'L		CABLE, COMM RCV	
	FINISH	DRAWN BY WM	DATE 8-20-99	CA1866 REV
		APPROVED		
		APPROVED	USED ON	SHEET 1 OF 1

CA1804



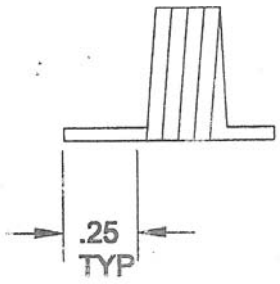
NOTES:
1. PREP EACH END THE SAME

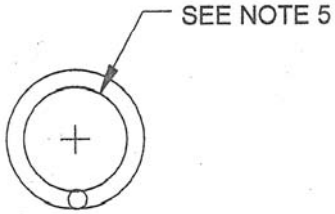
DIMENSION
A = .640 +/- .02
B = .140 +/- .02
C = .200 +/- .02
D = .220 +/- .02
L = 8.50 +/- .40

TERMINATE COMM(1 END ONLY)
ALL RADIOS, USE EC1704

TERMINATE NAV(1 END ONLY)
MX11----------EC1704
MX12----------EC2021 (HM1602)
MX170()----------EC1022 (HM1730)
MX300----------EC1704
MX385-EC1804 (HM1904)(HM1905)

SCALE:	TOLERANCE:	TKM, Inc. SCOTTSDALE, ARIZONA
MAT'L		CABLE ASSY, COAX
FINISH:	DWG. BY: WM	DATE 5-10-94 CA1804 REV
	APPROVED:	USED ON SS1866 SS1867 SHEET 1 OF 1
	APPROVED:	

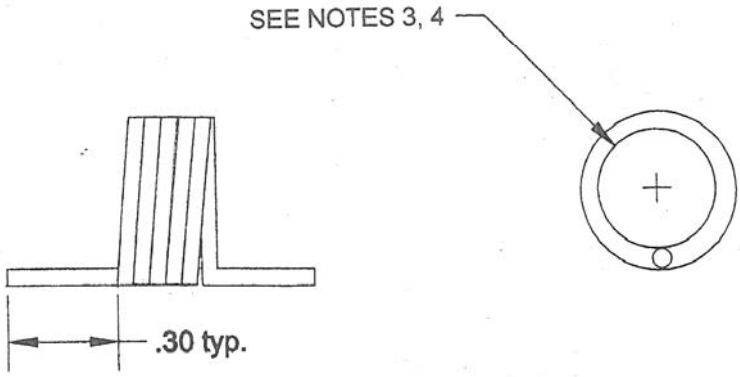




NOTES:

1. 4 TURNS CLOSE WOUND.
2. STRIP BOTH ENDS .200
3. FOR SS1866 & SS1867, USE GREEN #20 AWG SPN.
4. FOR SS1881, USE RED #18 AWG SPN.
5. ID
   SS1866 = .155
   SS1867 = .165
   SS1881 = .125

LFS4TN	SCALE	TOLERANCES	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L	.XXX +/- .015 ANGLES +/- 1 DEG Hole dia:+/-.002	INDUCTOR, RF		
	FINISH	DRAWN BY WM	DATE 7-7-00	LFS4TN	REV
		APPROVED			
		APPROVED	USED ON SS1866,SS1867,SS1881	SHEET 1 OF 1	



NOTES:

1. 5 TURNS CLOSE WOUND
2. STRIP BOTH ENDS .200
3. FOR NAV RECEIVER, ID IS .165
4. FOR COMM RECEIVER, ID IS .155

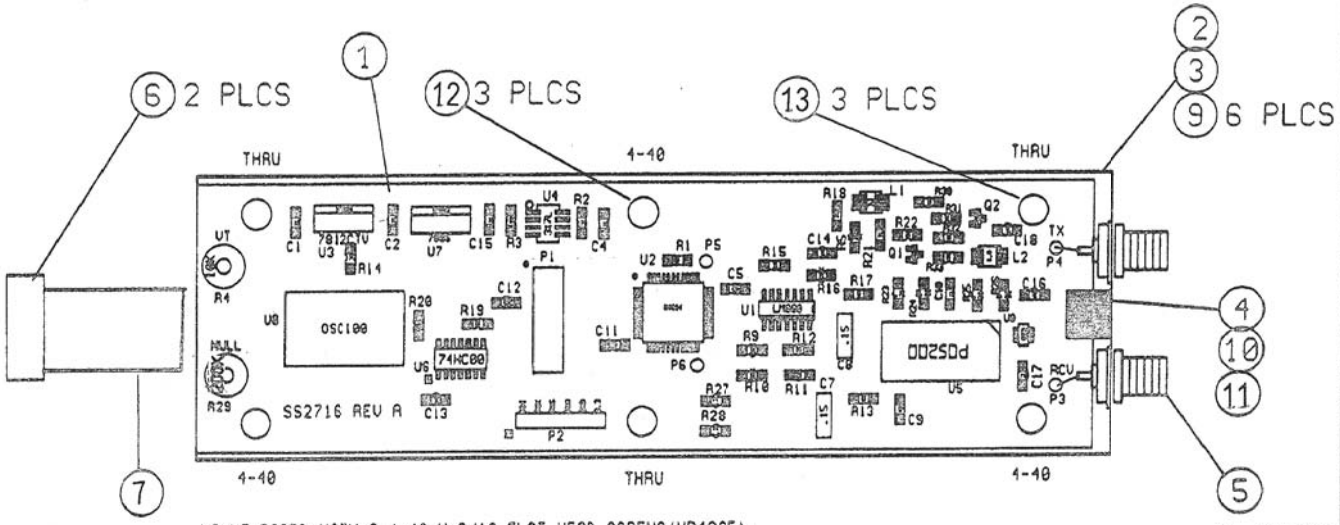
LFS5TN	SCALE	TOLERANCES	TKM, Inc SCOTTSDALE, ARIZONA	
	MAT'L 20 AWG SPN, RED	.XXX +/- .015 ANGLES +/- 1 DEG Hole dia:+/-.002	INDUCTOR, RF	
	FINISH	DRAWN BY WM	DATE 7-7-00	LFS5TN	REV
		APPROVED WM			
		APPROVED	USED ON SS1866, SS1867	SHEET 1 OF 1	

INDENTURED DRAWING LIST

MODULE SS2716 – COMM SYNTHESIZER

SS2716	REV A		COMM SYNTHESIZER ASSY
	PC2716	REV A	PCB, SYNTHESIZER; COMM
	SM1840	REV 3	CASE, MODULE
	NB400I	NONE	INSERT, EXTENDED
	SM1841	REV 3	COVER, MODULE
	SM1814	NONE	GND BRACKET; SYNTH

TKM, INC. SCOTTSDALE, AZ	NAME COMM SYNTHESIZER	PART # SS2716	REV. A
Parts identified with "*" in parts list shall have pads solder masked. Wave soldering shall be in accordance with WSP002. Hand soldering shall be in accordance with WSP001.		DATE 12-20-04 APPR APPR	
			DRAWN BY: WM



MOUNT BOARD WITH 3 4-40 X 3/16 FLAT HEAD SCREWS(NB403F).
ATTACH COVER WITH 3 4-40 X 3/16 FLAT HEAD SCREWS AND ONE 4-40 X 3/16 PAN HEAD SCREW
SOLDER GROUND STRAP AS SHOWN.

COMM SYNTHESIZER SS2716 REV A

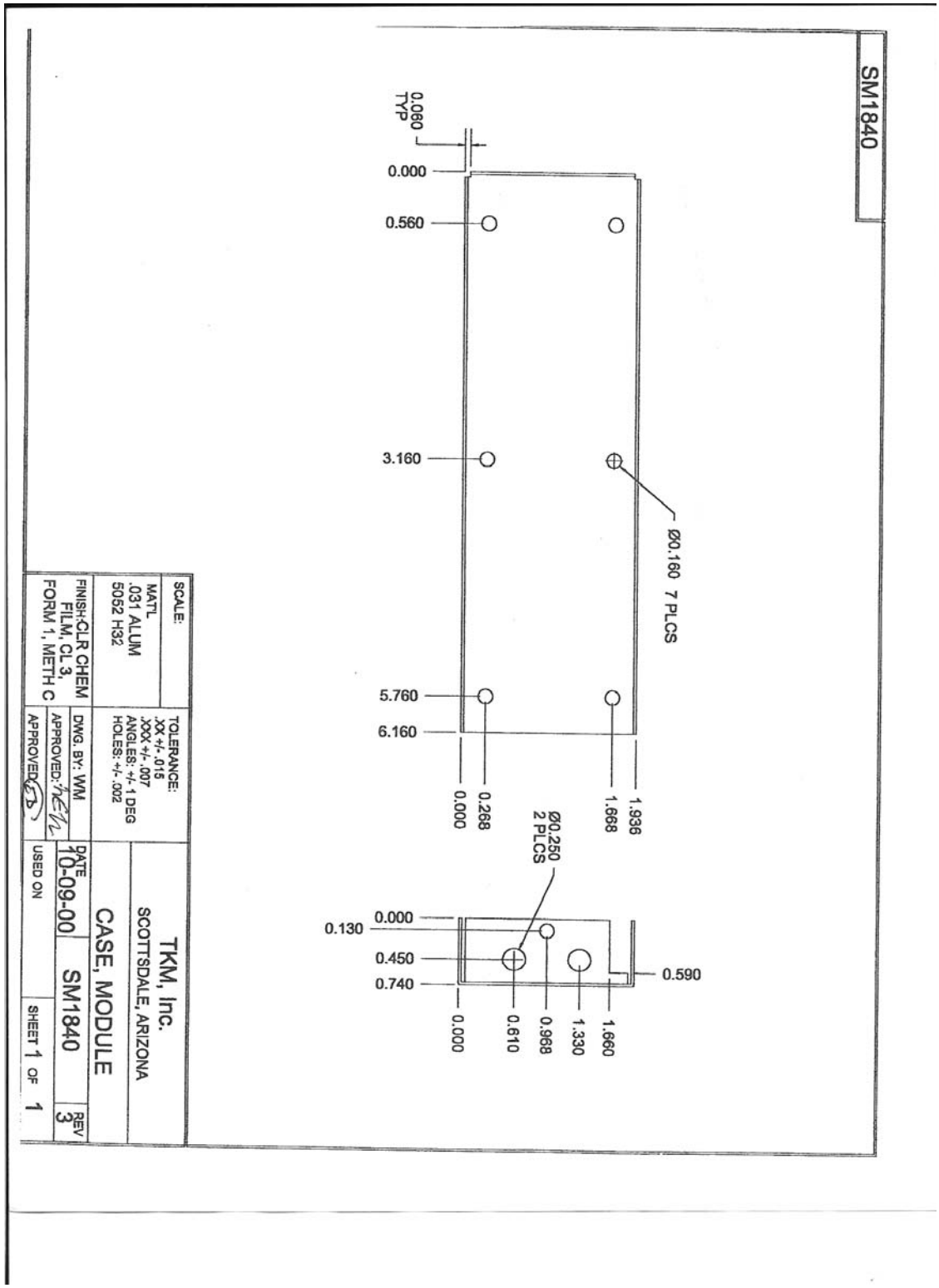
COMM SYNTHESIZER SS2716-A page 1

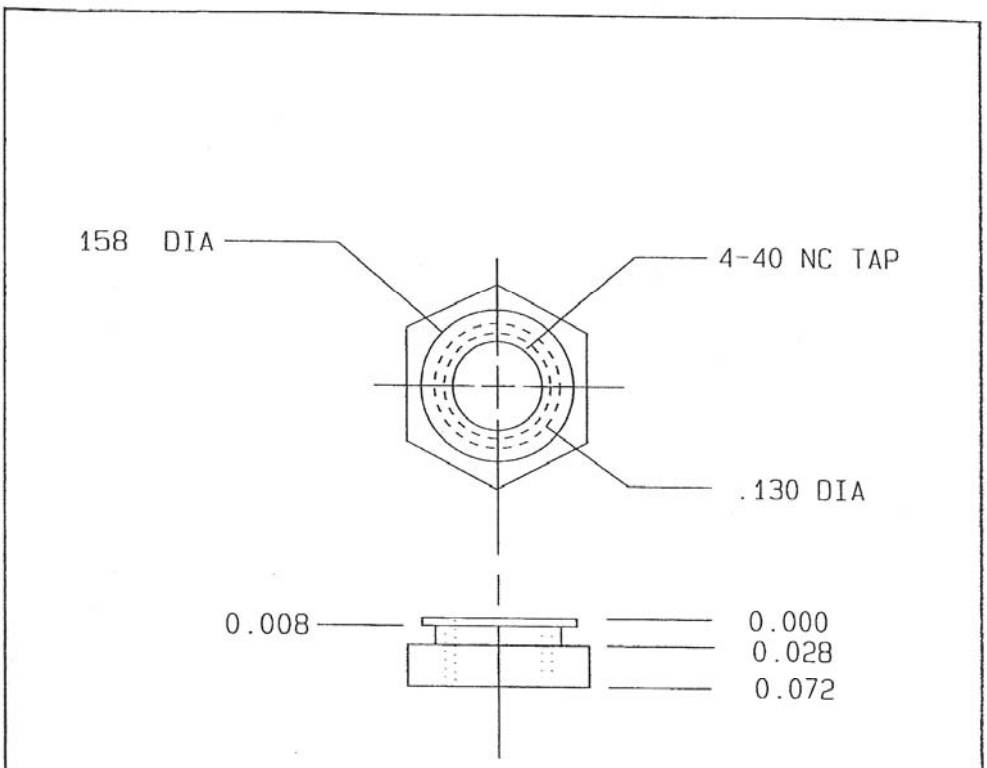
* indicates parts requiring soldermask.

Ref #	Part #	Description	Qty
01	PC2716-A	PCB SYNTHESIZER; COMM	1
02*	SM1840-3	SHEET METAL CASE; MODULE	1
03*	SM1841-3	SHEET METAL COVER; MODULE	1
04*	SM1814-	SHEET METAL BRACKET, GROUNDING, SYNTH.	1
05*	EC1703-	CONNECTOR CONN; SMA; PANEL MT.	2
06*	EC1002-	CONNECTOR 14 PIN; RIBBON CONN	2
07*	CA1400-	CABLE; RIBBON 14 CONDUCTOR; GRAY	3
09*	NB403F-	FASTENERS 4-40x3/16 P100 SS	6
10*	NB404P-	FASTENERS 4-40x1/4 PP SS	1
11*	NB400I-	FASTENERS INSERT; EXTENDED	1
12*	HS1816-2	SPACER STANDOFF; 4-40 THD	3
13*	HS1815-3	SPACER STANDOFF; THRU HOLE	3
C1	CS0104-	CAP; SMT; CER; .1 UF 1206	1
C10	CS0104-	CAP; SMT; CER; .1 UF 1206	1
C11	CS0103-	CAP; SMT; CER; .01 uF; 100V; 1206	1
C12	CS0101-	CAP; SMT; CER; 100PF; 100V; 1206	1
C13	CS0151-	CAP; SMT; CER; 150 pF 1206 5%	1
C14	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C15	CS0104-	CAP; SMT; CER; .1 UF 1206	1
C16	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C17	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C18	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C2	CS0104-	CAP; SMT; CER; .1 UF 1206	1
C4	CS0104-	CAP; SMT; CER; .1 UF 1206	1
C5	CS0103-	CAP; SMT; CER; .01 uF; 100V; 1206	1
C7*	CF1543-	CAPACITOR; FILM .15/63V	1
C8*	CF1543-	CAPACITOR; FILM .15/63V	1
C9	CS0103-	CAP; SMT; CER; .01 uF; 100V; 1206	1
L1	LS03R3-	IND; FIXED; SMT 3.3 uH; 10%; SMT	1
L2	LS01R0-	IND; FIXED; SMT 1.0 UH, 1210, 10%	1
P1*	MP1053-	MISC. PARTS PIN HEADERS; GOLD; DUAL ROW	1
Q1	QS3906-	TRANSISTOR; SMT PNP 2N3906	1
Q2	QS8133-	TRANSISTOR; SMT RF; 911 REPLACEMENT	1
R1	RS0103-	RES; SMT; FILM; 10K; 1/4W 5%; 1206	1
R10	RS0104-	RES; SMT; FILM; 100K; 1/4W 5%;1206	1
R11	RS0103-	RES; SMT; FILM; 10K; 1/4W 5%; 1206	1
R12	RS0103-	RES; SMT; FILM; 10K; 1/4W 5%; 1206	1
R13	RS0103-	RES; SMT; FILM; 10K; 1/4W 5%; 1206	1
R14	RS0471-	RES; SMT; FILM; 470 OHM; 1/4W 5%; 1206	1
R15	RS0102-	RES; SMT; FILM; 1K; 1/4W 5%; 1206	1
R16	RS0184-	RES; SMT; FILM; 180K 5%; 1206	1
R17	RS0471-	RES; SMT; FILM; 470 OHM; 1/4W 5%; 1206	1
R18	RS0102-	RES; SMT; FILM; 1K; 1/4W 5%; 1206	1
R19	RS0331-	RES; SMT; FILM; 330 Ohm, 5%, 1206	1
R2	RS0271-	RES; SMT; FILM; 270 OHM;1/4W 5%;1206	1

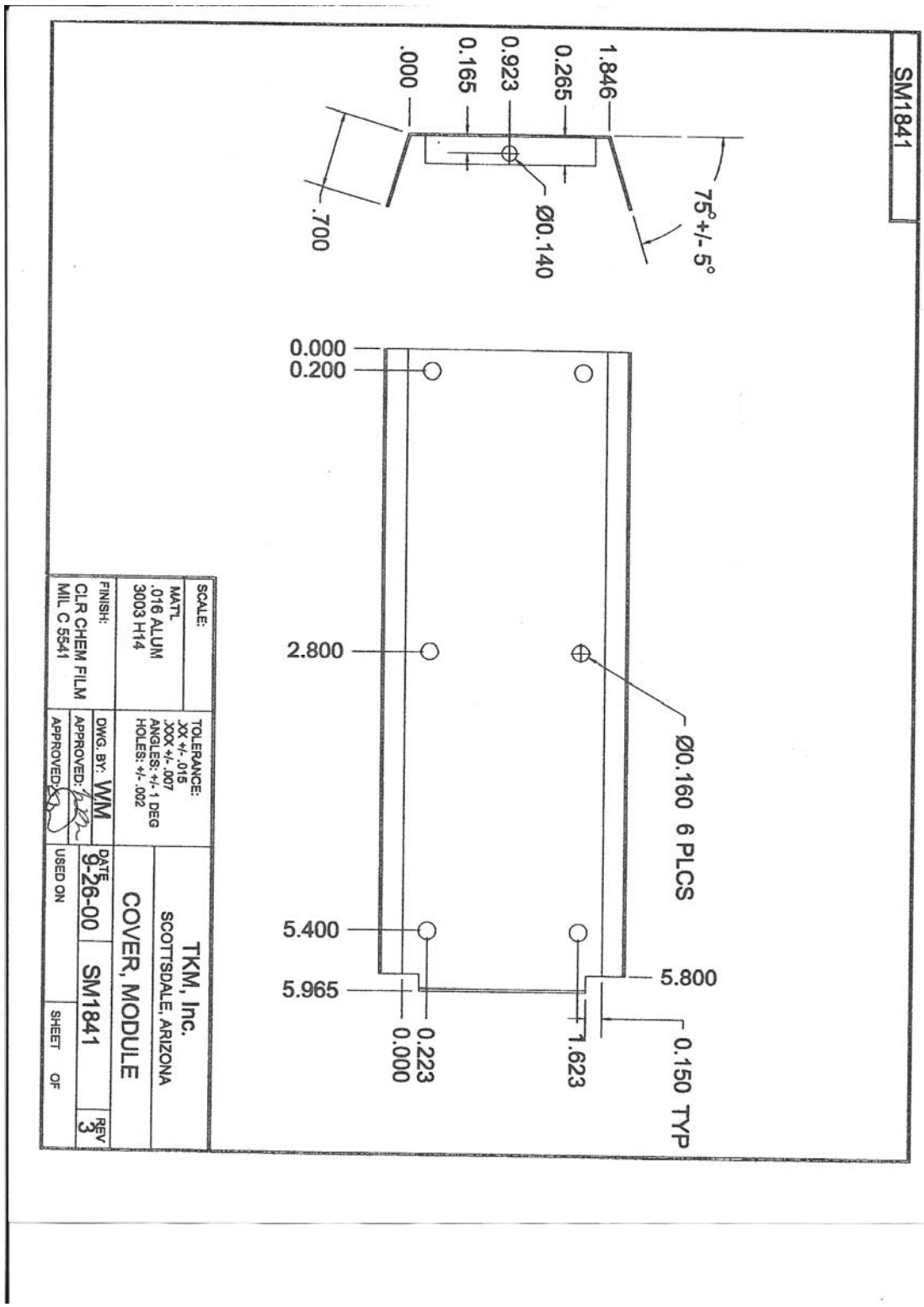
* indicates parts requiring soldermask.

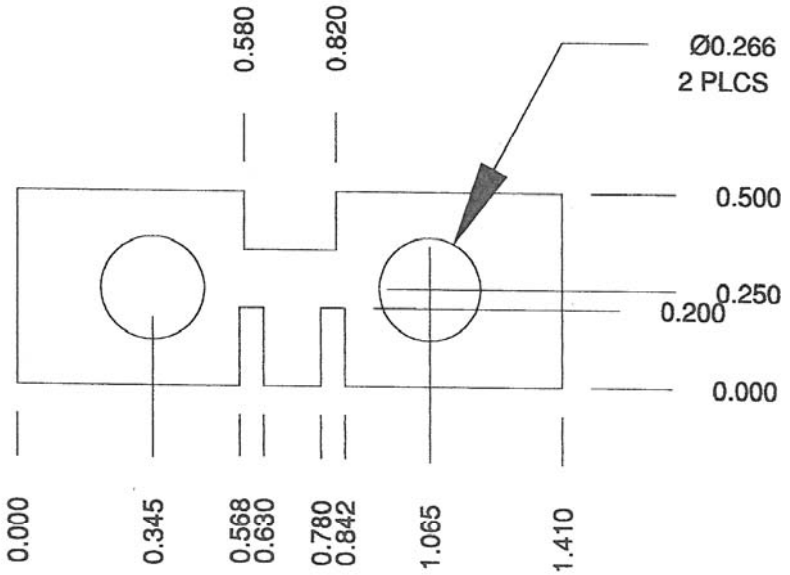
Ref #	Part #	Description	Qty
R20	RS0681-	RES; SMT; FILM; 680 OHM; 1206	1
R21	RS0102-	RES; SMT; FILM; 1K; 1/4W 5%; 1206	1
R22	RS0331-	RES; SMT; FILM; 330 Ohm, 5%, 1206	1
R23	RS0472-	RES; SMT; FILM; 4.7K; 1/4W 5%; 1206	1
R24	RS0222-	RES; SMT; FILM; 2.2K; 5%; 1206	1
R25	RS0472-	RES; SMT; FILM; 4.7K; 1/4W 5%; 1206	1
R26	RS0222-	RES; SMT; FILM; 2.2K; 5%; 1206	1
R27	RS0475-	RES; SMT; FILM; 4.7 MEGOHM; 1206	1
R28	RS0475-	RES; SMT; FILM; 4.7 MEGOHM; 1206	1
R29*	PW0204-	Top Adj. .3 dia 200K	1
R3	RS4320-	RES; SMT; FILM; 432 ohm; 1206	1
R30	RS0681-	RES; SMT; FILM; 680 OHM; 1206	1
R31	RS0102-	RES; SMT; FILM; 1K; 1/4W 5%; 1206	1
R32	RS0181-	RES; SMT; FILM; 180 OHM; 1/4W 5%:1206	1
R33	RS0471-	RES; SMT; FILM; 470 OHM; 1/4W 5%; 1206	1
R4*	PW0103-	Top Adj. .3 dia 10 K	1
R5	RS0184-	RES; SMT; FILM; 180K 5%; 1206	1
R9	RS0104-	RES; SMT; FILM; 100K; 1/4W 5%;1206	1
U1	IS0660-	INT. CKT.; SMT LM660 QUAD OP AMP	1
U2	IS4064-	INT. CKT.; SMT CPLD, 5nsec; 3.3V; MACH4000V	1
U3*	IM7812-	INT. CKT.; MISC. REGULATOR; 12V 7812	1
U4	IS317L-	INT. CKT.; SMT VOLTAGE REG	1
U5*	XT1200-	CRYSTAL; QUARTZ POS-200	1
U6	IS7400-	INT. CKT.; SMT QUAD NAND GATE	1
U7*	IM7805-	INT. CKT.; MISC. REGULATOR; 5V 7805	1
U8*	XT1000-	CRYSTAL; QUARTZ 1.0 MHZ OSC.	1
U9	ISG152-	INT. CKT.; SMT SPDT MMIC SWITCH	1


SM1840
0.060 TYP
0.000
0.560
3.160
5.760
6.160
Ø0.160 7 PLCS
0.000
0.268
1.668
1.936
Ø0.250 2 PLCS
0.130
0.000
0.450
0.740
0.590
0.000
0.610
0.968
1.330
1.660
SCALE:
MATL
.031 ALUM
5052 H32
TOLERANCE:
.XX +/- .015
.XXX +/- .007
ANGLES: +/- 1 DEG
HOLES: +/- .002
FINISH:CLR CHEM FILM, CL 3, FORM 1, METH C
DWG. BY: WM
APPROVED:
DATE
10-09-00
USED ON
TKM, Inc.
SCOTTSDALE, ARIZONA
CASE, MODULE
SM1840
REV
3
SHEET 1 OF 1



	SCALE 8X	TOLERANCE .XX +/- .005 .XXX +/- .002 ANGLES +/- 1 DEG. FRACT. +/- 1/32	TKM, INC. SCOTTSDALE, AZ
	MAT'L 3/16 SS ROD		INSERT, EXTENDED
	FINISH	DRAWN BY WEM	DATE 4-5-99 NB400I REV
		APPROVED	USED ON SHEET OF
		APPROVED	


SM1841
1.846
0.265
0.923
0.165
.000
.700
Ø0.140
75°+/- 5°
0.000
0.200
2.800
5.400
5.965
Ø0.160 6 PLCS
5.800
1.623
0.223
0.000
0.150 TYP
SCALE:
MATL
.016 ALUM
3003 H114
TOLERANCE:
.XX +/- .015
.XXX +/- .007
ANGLES: +/- 1 DEG
HOLES: +/- .002
FINISH:
CLR CHEM FILM
MIL C 5541
DWG. BY: WM
APPROVED:
APPROVED:
TKM, Inc.
SCOTTSDALE, ARIZONA
COVER, MODULE
DATE
9-26-00
SM1841
REV
3
USED ON
SHEET OF

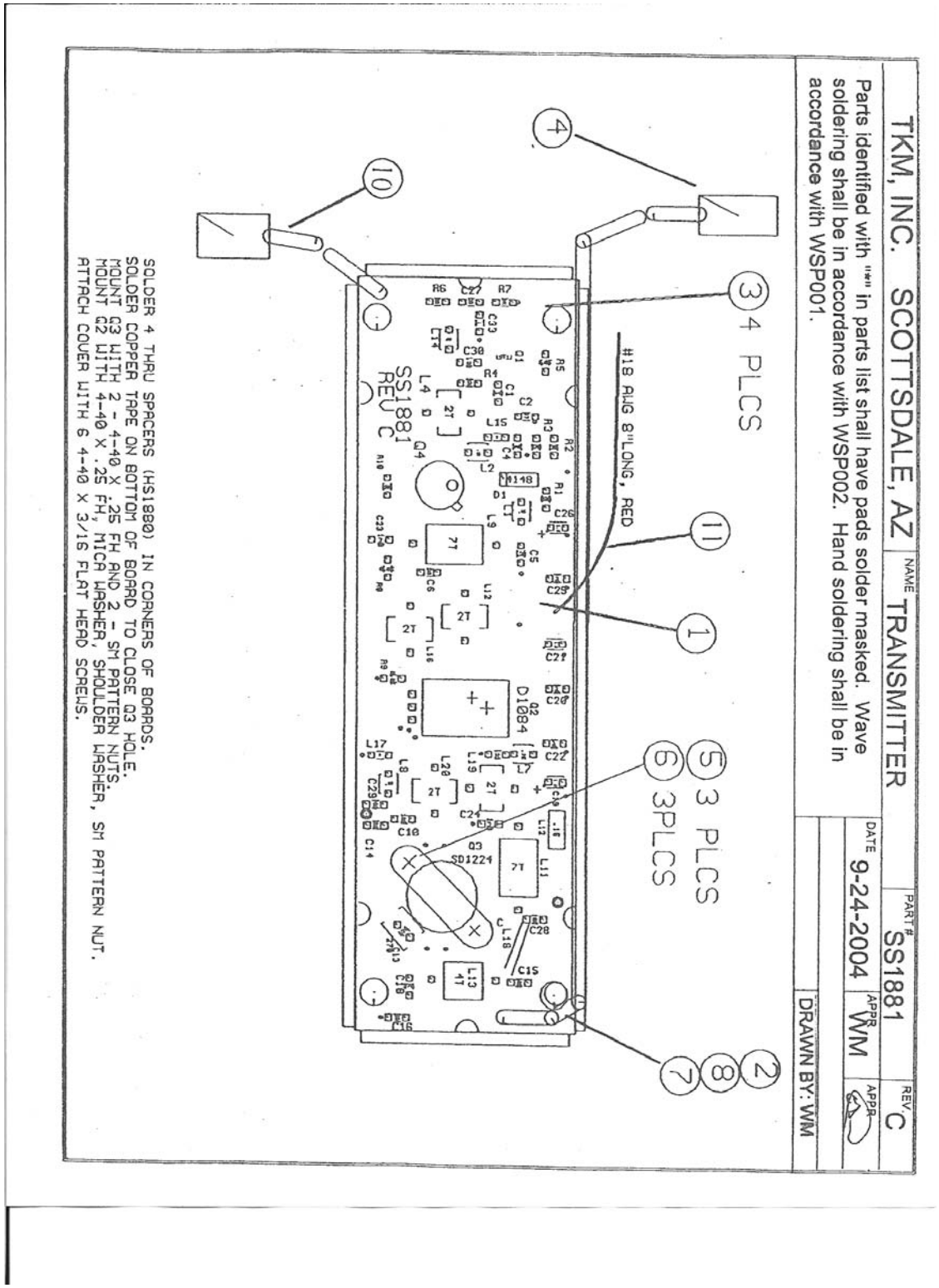


SM1814	SCALE	TOLERANCES	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L .016 1/2 HARD BRASS	.XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	BRACKET, GROUNDING		
	FINISH BRIGHT TIN per MIL T 10727	DRAWN BY WM APPROVED APPROVED	DATE 8-20-99	SM1814	REV
			USED ON	SHEET 1 OF 1	

INDENTURED DRAWING LIST

MODULE SS1881 - TRANSMITTER

SS1881	REV C	TRANSMITTER, TOP ASSY
PC1881	REV C	PCB TRANSMITTER
SM1883	REV 9	BASE, TRANSMITTER
SM1813	REV 2	COVER, TRANSMITTER
CA1802	NONE	CABLE ASSY, COAX
CA1801	NONE	CABLE ASSY, COAX
LFS7TN	NONE	INDUCTOR, RF
LFS2TN	NONE	INDUCTOR, RF
LFS4TN	NONE	INDUCTOR, RF
RN0002	NONE	RESISTOR, METAL FILM


TKM, INC. SCOTTSDALE, AZ
NAME TRANSMITTER
PART # SS1881
REV C
DATE 9-24-2004
APPR WM
APPR
DRAWN BY: WM
Parts identified with "*" in parts list shall have pads solder masked. Wave soldering shall be in accordance with WSP002. Hand soldering shall be in accordance with WSP001.
4
10
3 4 PLCS
#18 AWG 8"LONG, RED
11
1
5 3 PLCS
6 3PLCS
2
8
7
SS1881
REV C
SOLDER 4 THRU SPACERS (HS1880) IN CORNERS OF BOARDS.
SOLDER COPPER TAPE ON BOTTOM OF BOARD TO CLOSE Q3 HOLE.
MOUNT Q3 WITH 2 - 4-40 X .25 FH AND 2 - SM PATTERN NUTS.
MOUNT Q2 WITH 4-40 X .25 FH, MICA WASHER, SHOULDER WASHER, SM PATTERN NUT.
ATTACH COVER WITH 6 4-40 X 3/16 FLAT HEAD SCREWS.

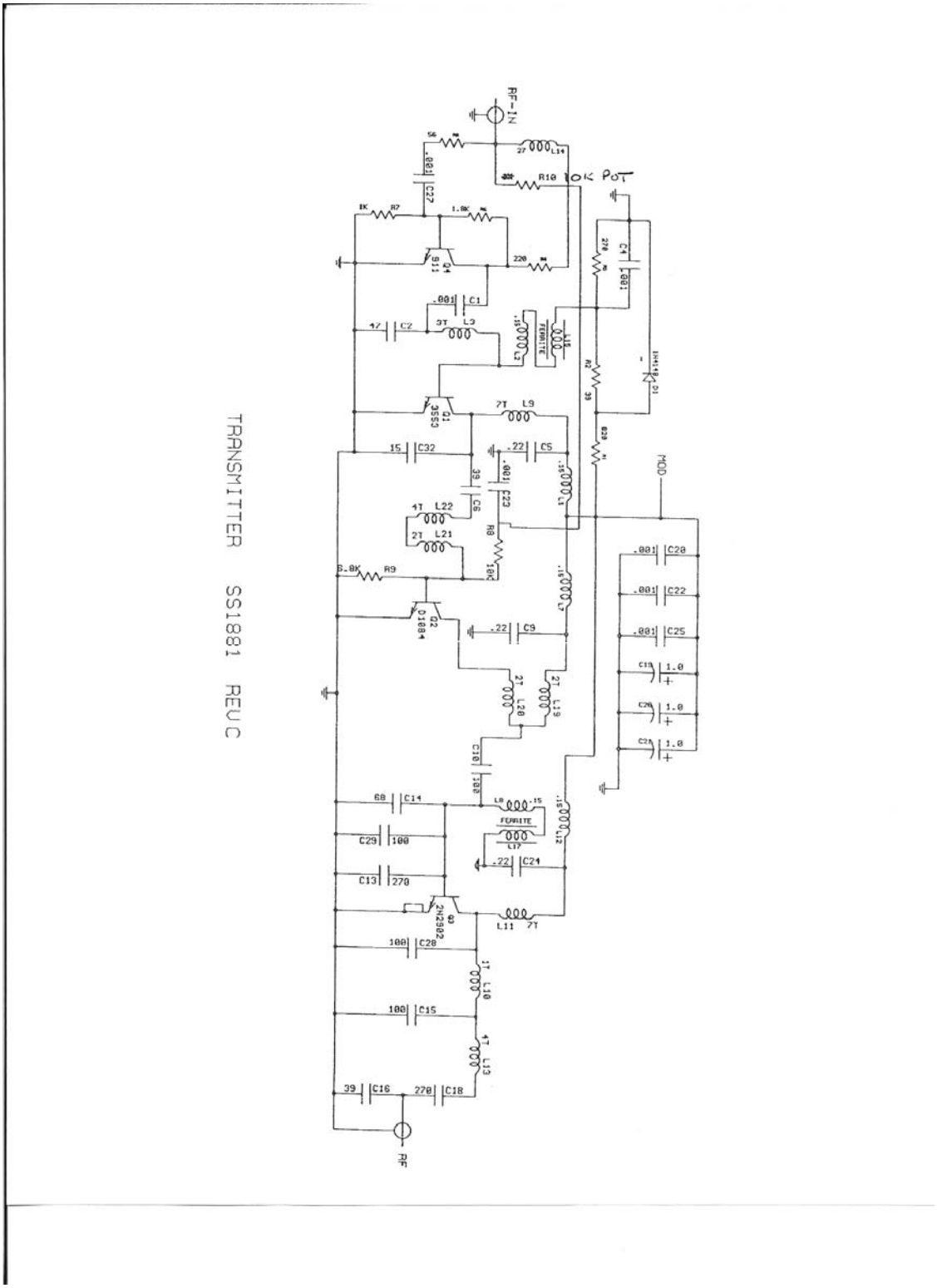
TRANSMITTER SS1881-C page 1

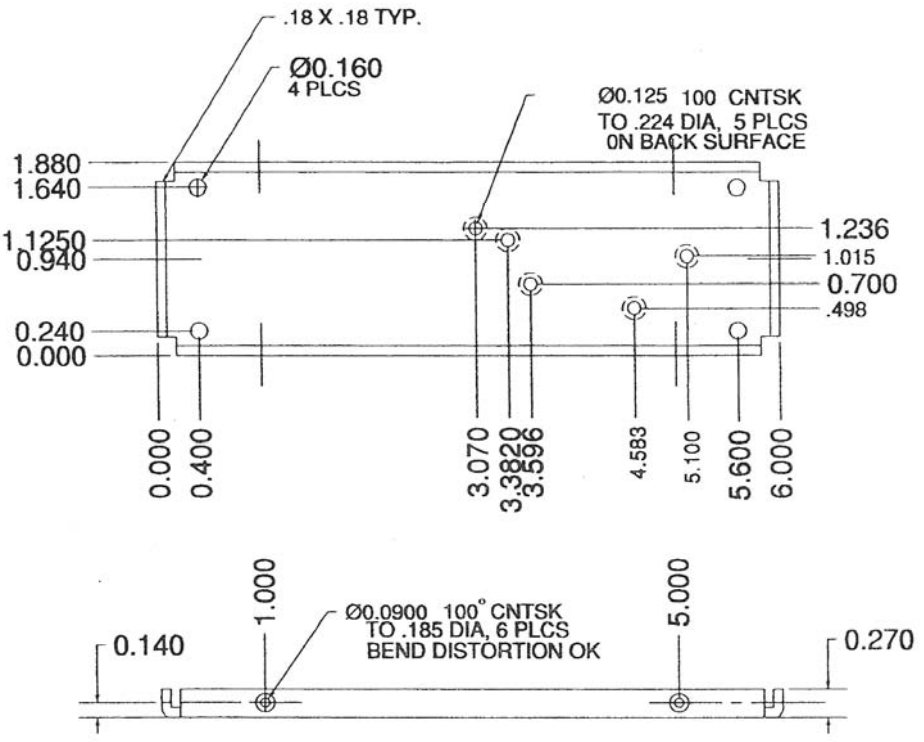
* indicates parts requiring soldermask.

Ref #	Part #	Description	Qty
01	PC1881-C	PCB TRANSMITTER	1
02*	SM1883-9	SHEET METAL BASE; TRANSMITTER	1
03*	HS1003-	SPACER 3/16 RD X .660 THRU (TX)	4
04*	CA1802-	CABLE; RIBBON COAX CABLE ASSY	2
05*	NB405F-	FASTENERS 4-40x5/16 P100 SS	3
06*	NB400N-	FASTENERS 4-40 SM NUT SS	3
07*	NB403F-	FASTENERS 4-40x3/16 P100 SS	6
08*	SM1813-3	SHEET METAL Cover, TX	1
09*	MP1051-	MISC. PARTS NYLON SHOULDER WASHER	1
10*	CA1801-	CABLE; RIBBON COAX CABLE ASSY	1
C1	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C10	CG1016-	CAP; CER. CHIP 100 PF; 50 V; 1010	1
C13	CG2716-	CAP; CER. CHIP 270 PF; RF	1
C14	CG1516-	CAP; CER. CHIP 150 PF; 50 V; 1010	1
C15	CG1516-	CAP; CER. CHIP 150 PF; 50 V; 1010	1
C16	CG3906-	CAP; CER. CHIP 39 pF; 50V; .1X.1; 5%	1
C18	CG2716-	CAP; CER. CHIP 270 PF; RF	1
C19	CX0105-	CAP; SMT; TANT 1.0 uF; 35 V	1
C2	CS0470-	CAP; SMT; CER; 47pF; 100V; 1206	1
C20	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C21	CX0105-	CAP; SMT; TANT 1.0 uF; 35 V	1
C22	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C23	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C24*	CR1024-	CAP; MONO-CERAMIC .001uF; 100V	1
C25	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C26	CX0105-	CAP; SMT; TANT 1.0 uF; 35 V	1
C27	CS0390-	CAP; SMT; CER; 39pF; 100V; 1206	1
C30	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C33	CS0150-	CAP; SMT; CER; 15pf; 100V; 1206	1
C4	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C5	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C6	CS0390-	CAP; SMT; CER; 39pF; 100V; 1206	1
C9	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
D1*	DD4148-	DIODE 1N4148	1
L1	LS0154-	IND; FIXED; SMT .15 uH; 10% SMT	1
L11*	LFS7TN-	INDUCTOR; FIXED	1
L12*	LFS2TN-	INDUCTOR; FIXED	1
L13*	LFS4TN-	INDUCTOR; FIXED	1
L14	LS0270-	IND; FIXED; SMT 27 uH; 10% SMT	1
L15	LFRRIT-	INDUCTOR; FIXED BEAD; SMT; 1206	1
L16*	LFS2TN-	INDUCTOR; FIXED	1
L17*	MP1036-	MISC. PARTS BEAD; FERRITE	1
L18*	RN0002-	RESISTOR; METAL FILM 18 AWG BUS WIRE 1" LONG	1
L19*	LFS2TN-	INDUCTOR; FIXED	1
L2	LS0154-	IND; FIXED; SMT .15 uH; 10% SMT	1

* indicates parts requiring soldermask.

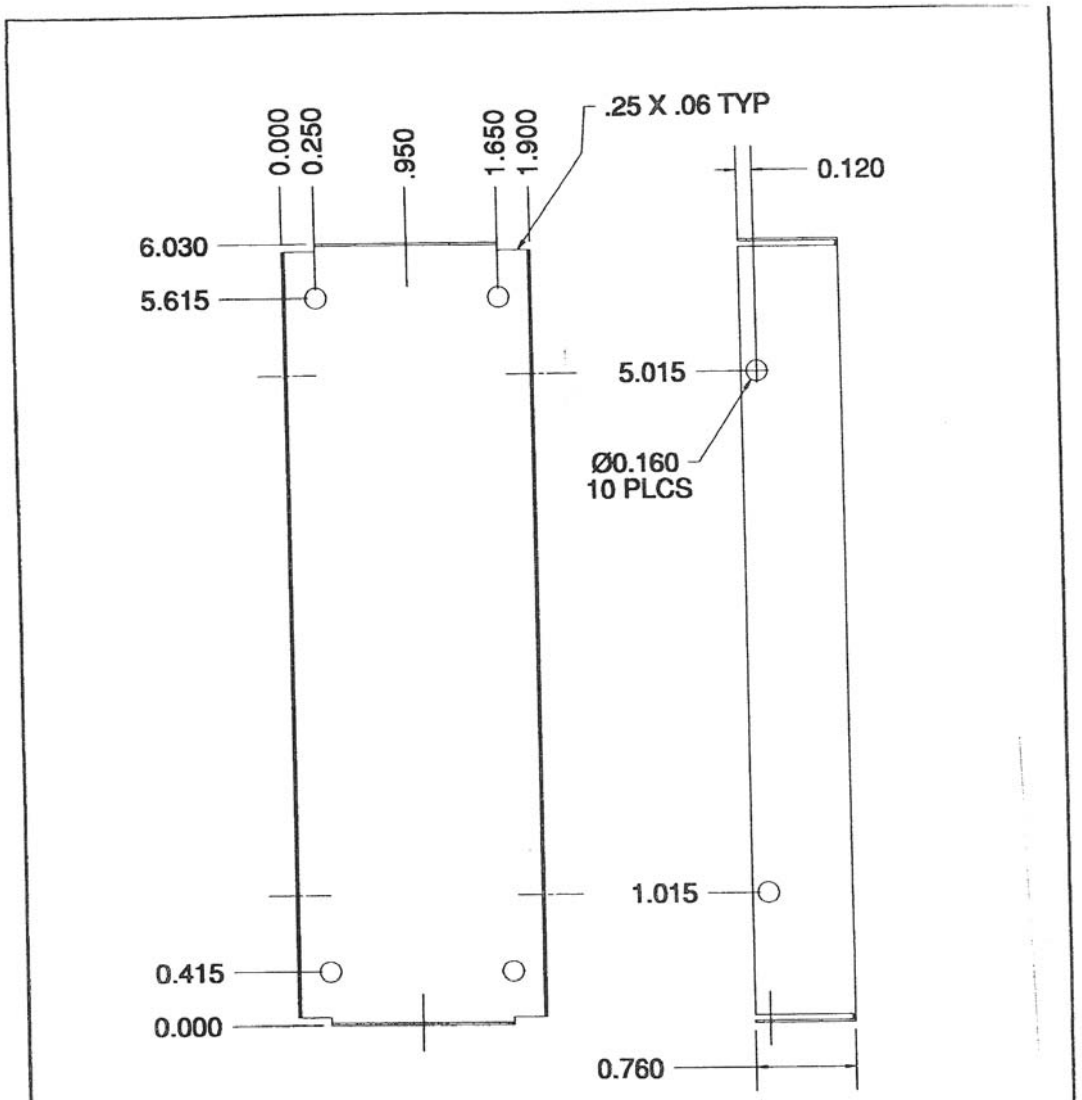
Ref #	Part #	Description	Qty
L20*	LFS2TN-	INDUCTOR; FIXED	1
L4*	LFS2TN-	INDUCTOR; FIXED	1
L5	LS0154-	IND; FIXED; SMT .15 uH; 10% SMT	1
L6*	LFS2TN-	INDUCTOR; FIXED	1
L7	LS0154-	IND; FIXED; SMT .15 uH; 10% SMT	1
L8	LS0154-	IND; FIXED; SMT .15 uH; 10% SMT	1
L9*	LFS7TN-	INDUCTOR; FIXED	1
Q1	QS8133-	TRANSISTOR; SMT RF; 911 REPLACEMENT	1
Q2*	QX1084-	TRANSISTOR RF POWER; 4 W	1
Q3*	QX1224-	TRANSISTOR RF AMP. 40 W	1
Q4*	QX3553-	TRANSISTOR 2N3553	1
R1	RS0821-	RES; SMT; FILM; 820 OHM;1/4W 5%; 1206	1
R11	PS0503-	POT; SMT; 50 Kohm, 3 mm.	1
R2	RS0390-	RES; SMT; FILM; 39 OHM; 1/4W 5%; 1206	1
R3	RS0151-	RES; SMT; FILM; 150 OHM; 5%; 1206	1
R4	RS0221-	RES; SMT; FILM; 220 OHM; 1/4W 5%;1206	1
R5	RS0182-	RES; SMT; FILM; 1.8K; 1/4W 5%; 1206	1
R6	RS0560-	RES; SMT; FILM; 56 OHM;1/4W 5%;1206	1
R7	RS0102-	RES; SMT; FILM; 1K; 1/4W 5%; 1206	1
R8	RS0472-	RES; SMT; FILM; 4.7K; 1/4W 5%; 1206	1
R9	RS0392-	RES; SMT; FILM; 3.9K; 5%; 1206	1


TRANSMITTER SS1881 REV C
RF-IN
R10 10K POT
MOD
RF



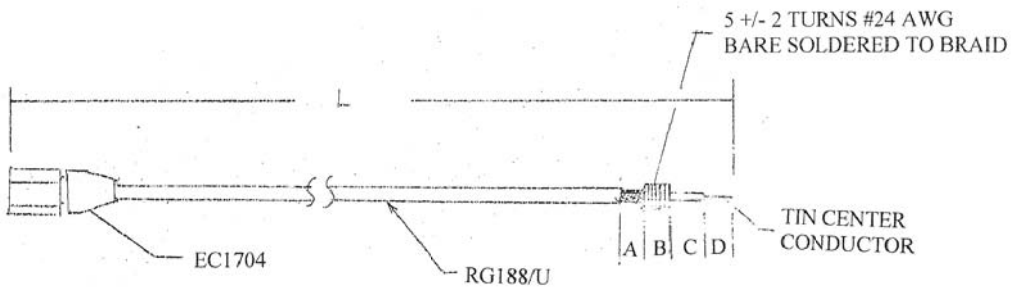
EDGE HOLES TO BE TAPPED 4-40 NC 6 PLACES AFTER FORMING.

SM1883	SCALE	TOLERANCES .XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG HOLE DIA +/- .002	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L .090 ALUM 5052 H32		BASE, TRANSMITTER		
	FINISH CLR CHEM FILM MIL C 5541	DRAWN BY WM APPROVED APPROVED	DATE 6/1/04	SM1883	REV 9
			USED ON SS1881	SHEET 1 OF 1	



SM1813	SCALE	TOLERANCES	TKM, Inc SCOTTSDALE, ARIZONA	
	MAT'L .016 ALUM 3003 H14	.XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	COVER, TRANSMITTER	
	FINISH CLR CHEM FILM MIL C 5541	DRAWN BY WM APPROVED APPROVED	DATE 8-8-00	SM1813 REV 3
			USED ON SS1881	SHEET 1 OF 1

CA1802

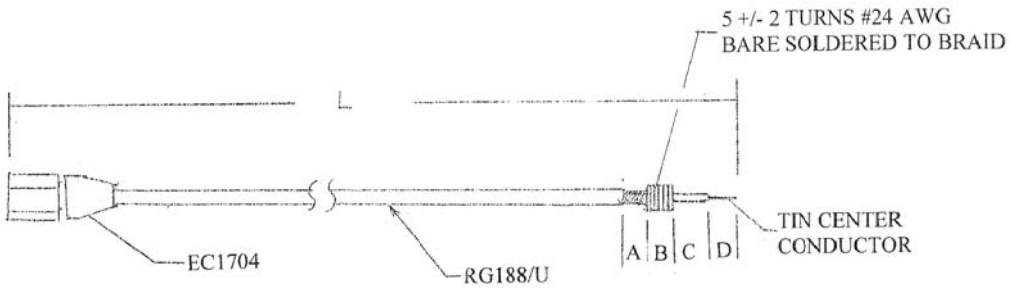


DIMENSION

A = .200 +/- .020
B = .120 +/- .020
C = .300 +/- .020
D = .100 =/- .020
L = 13.5 +/- .040

SCALE:	TOLERANCE:	TKM, Inc. SCOTTSDALE, ARIZONA
MAT'L		CABLE ASSY, COAX
FINISH:	DWG. BY: WM	DATE 5-10-94 / CA1802 / REV
	APPROVED:	
	APPROVED:	USED ON SS1881 / SHEET 1 OF 1

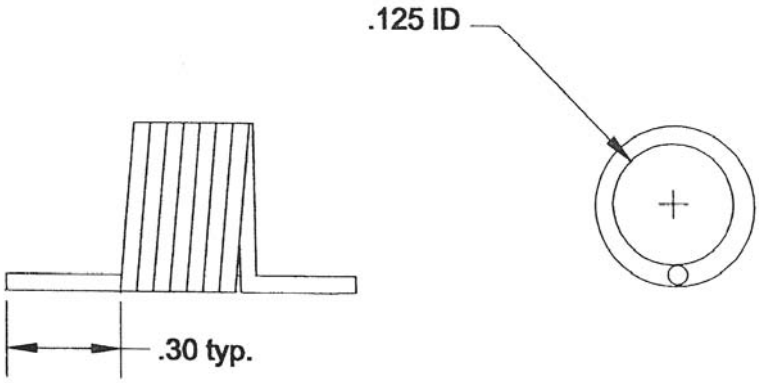
CA1801



DIMENSION

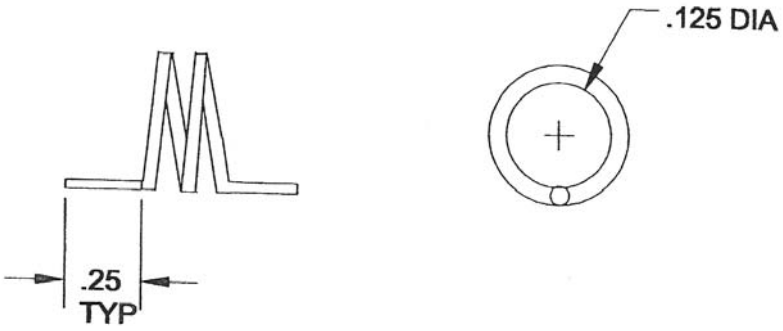
A = .200 +/- .020
B = .120 +/- .020
C = .160 +/- .020
D = .200 =/- .020
L = 5.50 +/- .040

SCALE:	TOLERANCE:	TKM, Inc. SCOTTSDALE, ARIZONA	
MAT'L		CABLE ASSY, COAX	
FINISH:	DWG. BY: WM	DATE 5-10-94	CA1801 REV
	APPROVED:	USED ON SS1881	SHEET 1 OF 1
	APPROVED:		



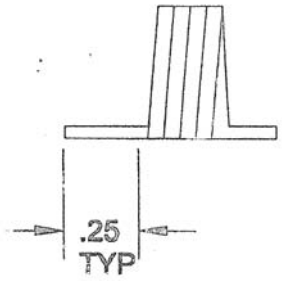
NOTES
1. 7 TURNS CLOSE WOUND
2. STRIP BOTH ENDS .20

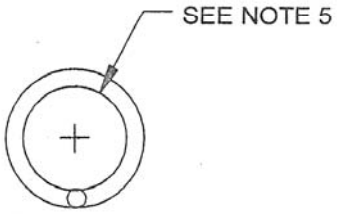
LFS7TN	SCALE	TOLERANCES	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L #18 AWG SPN	.XXX +/- .015 ANGLES +/- 1 DEG Hole dia:+/-.002	INDUCTOR, RF		
	FINISH	DRAWN BY WM	DATE 7-7-00	LFS7TN	REV
		APPROVED			
		APPROVED	USED ON SS1881(TX)	SHEET 1 OF 1	



NOTES
1. 2 TURNS; .2 LENGTH
2. STRIP BOTH ENDS .20

LFS2TN	SCALE	TOLERANCES	TKM, Inc SCOTTSDALE, ARIZONA	
	MAT'L #18 AWG SPN	.XXX +/- .015 ANGLES +/- 1 DEG Hole dia:+/-.002	INDUCTOR, RF	
	FINISH	DRAWN BY WM	DATE 7-7-00	LFS2TN REV
		APPROVED	USED ON SS1881(TX)	SHEET 1 OF 1
		APPROVED		

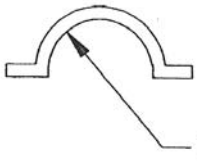




NOTES:

1. 4 TURNS CLOSE WOUND.
2. STRIP BOTH ENDS .200
3. FOR SS1866 & SS1867, USE GREEN #20 AWG SPN.
4. FOR SS1881, USE RED #18 AWG SPN.
5. ID
   SS1866 = .155
   SS1867 = .165
   SS1881 = .125

LFS4TN	SCALE	TOLERANCES	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L	.XXX +/- .015 ANGLES +/- 1 DEG Hole dia:+/-.002	INDUCTOR, RF		
	FINISH	DRAWN BY WM	DATE 7-7-00	LFS4TN	REV
		APPROVED			
		APPROVED	USED ON SS1866,SS1867,SS1881	SHEET 1 OF 1	



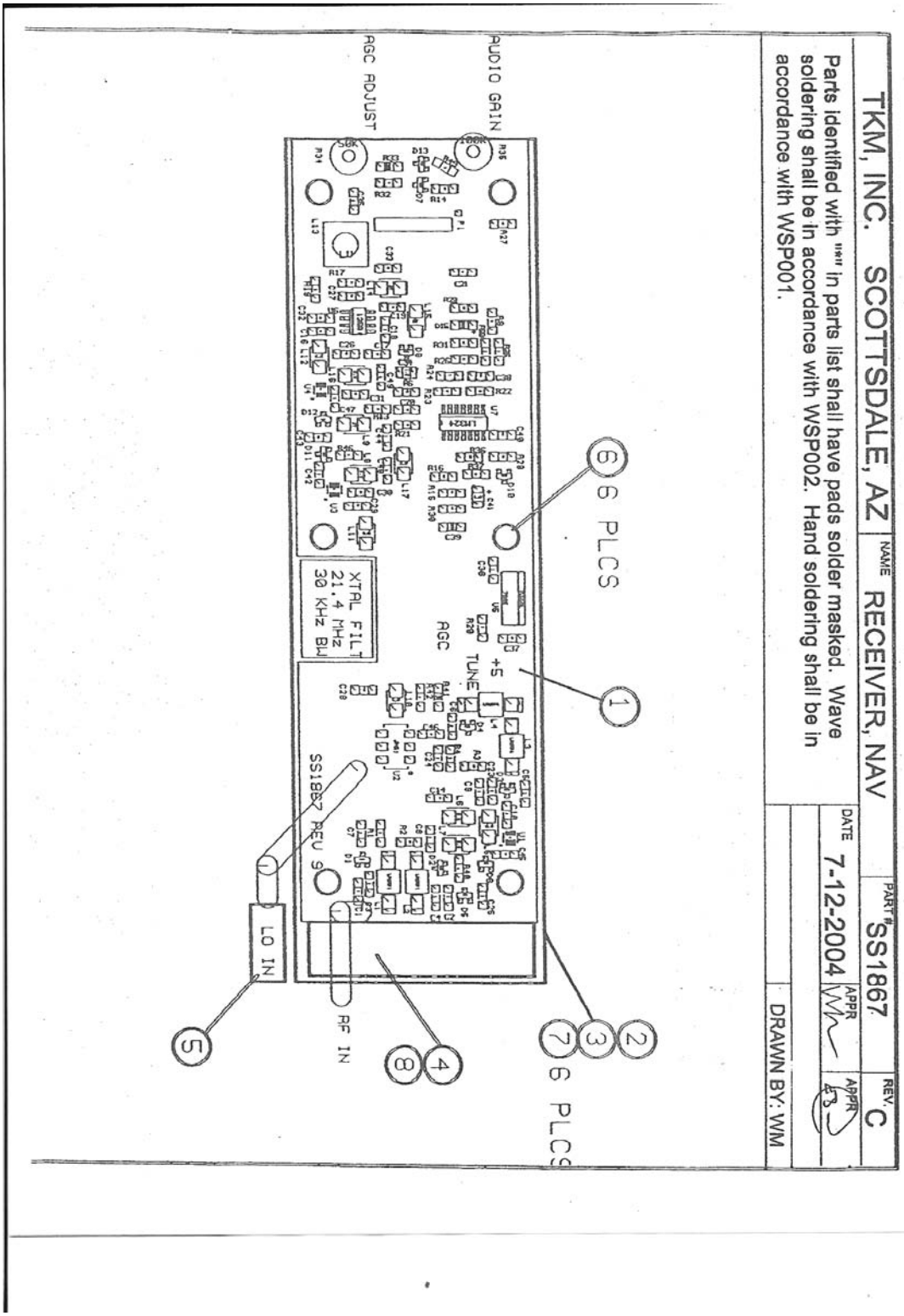
NOTES
1. OVERALL LENGTH OF WIRE TO BE 1.0

RN0002	SCALE	TOLERANCES	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L #18 AWG BARE TINNED	.XXX +/- .015 ANGLES +/- 1 DEG Hole dia:+/-.002	RESISTOR, METAL FILM		
	FINISH	DRAWN BY WM	DATE 7-7-00	RN0002	REV
		APPROVED			
		APPROVED	USED ON SS1881(TX)	SHEET 1 OF 1	

INDENTURED DRAWING LIST

MODULE SS1867 – NAV RECEIVER (BLUE)

SS1867	REV C		RECEIVER ASSY; COMM (GREEN)
	PC1866	REV C	PCB, RECEIVER
	SM1840	REV 3	CASE, MODULE
	SM1841	REV 3	COVER, MODULE
	SM1812	REV 2	GND BRACKET; RX
	CA1803	NONE	CABLE ASSY, COAX
	CA1867	NONE	CABLE, NAV RECEIVER
	CA1804	NONE	CABLE ASSY, COAX
	LFST4N	NONE	INDUCTOR, RF
	LFST5N	NONE	INDUCTOR, RF


TKM, INC. SCOTTSDALE, AZ
NAME RECEIVER, NAV
PART # SS1867
REV. C
Parts identified with "*" in parts list shall have pads solder masked. Wave soldering shall be in accordance with WSP002. Hand soldering shall be in accordance with WSP001.
DATE 7-12-2004
APPR
APPR
DRAWN BY: WM
AUDIO GAIN
AGC ADJUST
6 PLCS
XTAL FILT
21.4 MHz
30 KHz BW
AGC
TUNE
+5
SS1867 REV 9
LO IN
RF IN
6 PLCS
1
2
3
4
5
6
7
8

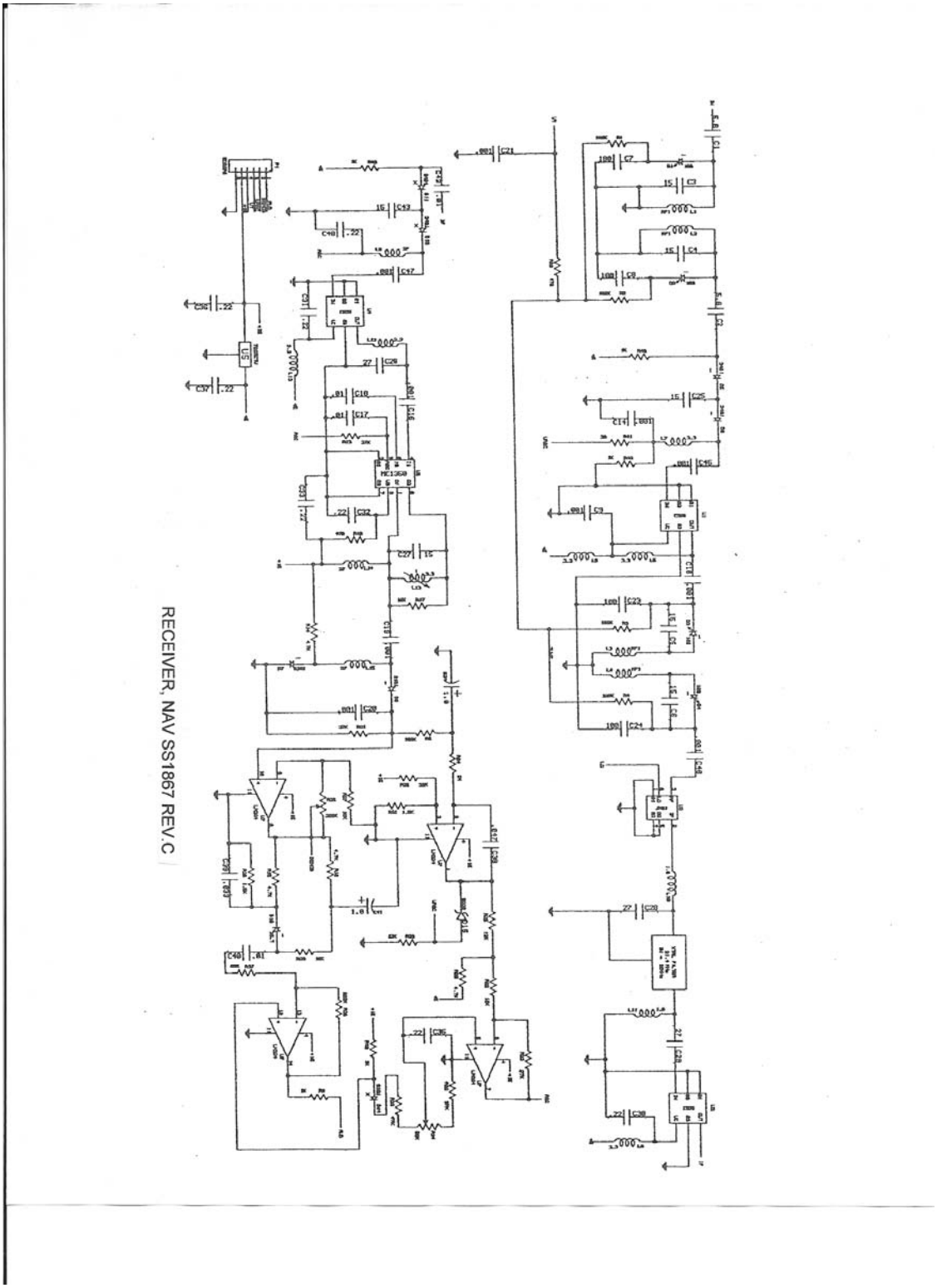
RECEIVER; NAV SS1867-C page 1

* indicates parts requiring soldermask.

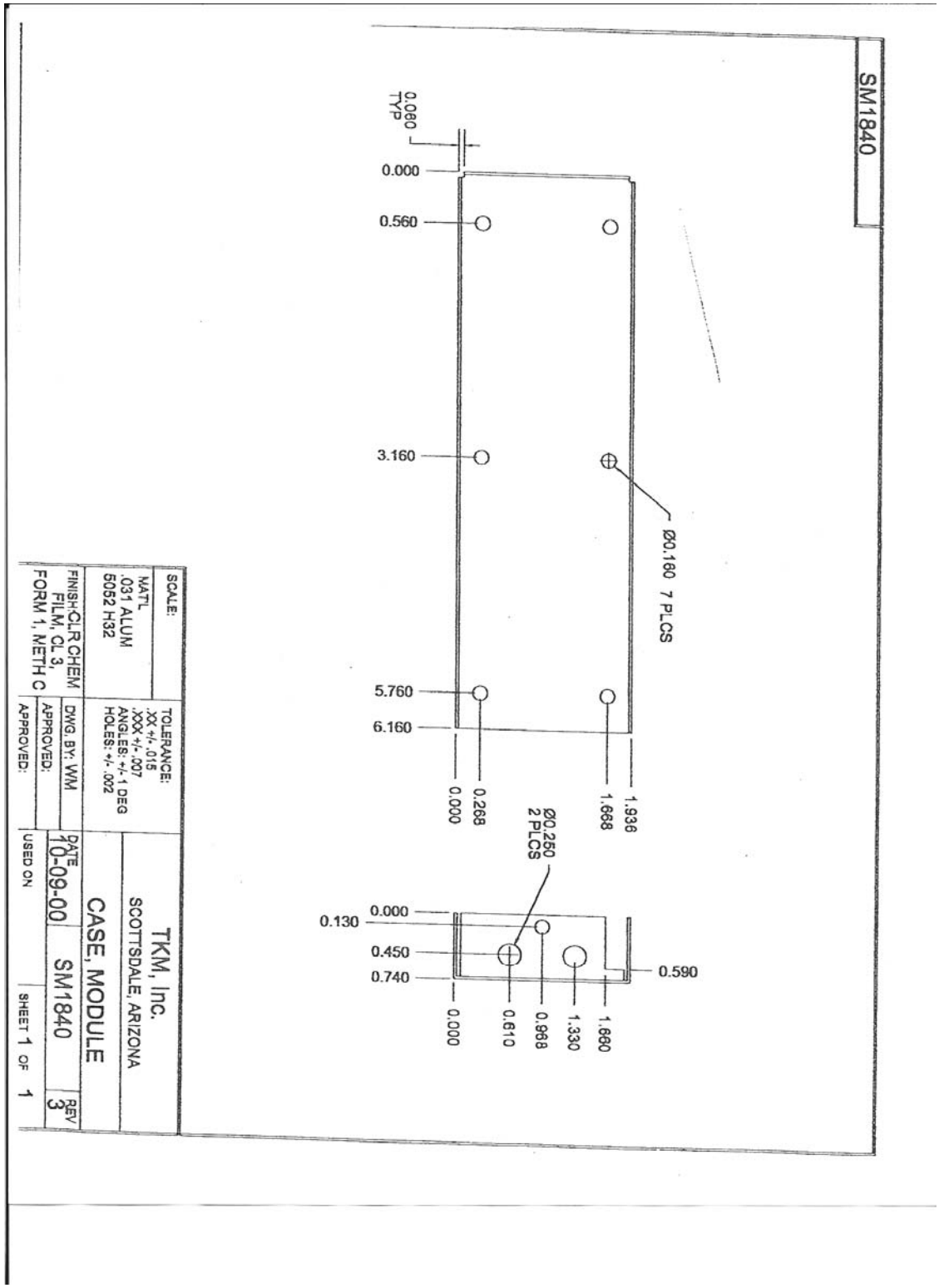
Ref #	Part #	Description	Qty
01	PC1866-C	PCB RECEIVER; COMM-GREEN, NAV-BLUE	1
02*	SM1840-3	SHEET METAL CASE; MODULE	1
03*	SM1841-3	SHEET METAL COVER; MODULE	1
04*	SM1812-2	SHEET METAL GND BRACKET; RX	1
05*	CA1803-	CABLE; RIBBON ASSEMBLY,COAX CONN RG188	2
06*	HS1816-2	SPACER STANDOFF; 4-40 THD	6
07*	NB403F-	FASTENERS 4-40x3/16 P100 SS	6
08*	NB404S-	FASTENERS #4 X 1/4 SS Sheet Metal	1
09*	CA1867-	CABLE; RIBBON Receiver, Nav; 6 cond.	1
10*	MP1044-	MISC. PARTS PIN HEADER; GOLD; SINGLE	1
11*	EC1709-	CONNECTOR HOUSING; 6 PIN	2
12*	EC1806-	CONNECTOR CRIMP PINS; SMALL	6
13*	CA1804-	CABLE; RIBBON COAX ASSY CABLE	0
C1	CS05R6-	CAP; SMT; CER; 5.6pF; 100V; 1206	1
C10	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C14	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C16	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C17	CS0103-	CAP; SMT; CER; .01 uF; 100V; 1206	1
C18	CS0103-	CAP; SMT; CER; .01 uF; 100V; 1206	1
C19	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C2	CS05R6-	CAP; SMT; CER; 5.6pF; 100V; 1206	1
C20	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C21	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C23	CS0101-	CAP; SMT; CER; 100PF; 100V; 1206	1
C24	CS0101-	CAP; SMT; CER; 100PF; 100V; 1206	1
C25	CS0150-	CAP; SMT; CER; 15pf; 100V; 1206	1
C26	CS0150-	CAP; SMT; CER; 15pf; 100V; 1206	1
C27	CS0270-	CAP; SMT; CER; 27 PF; 50V; 1206	1
C28	CS0220-	CAP; SMT; CER; 22 PF; 100V	1
C29	CS0220-	CAP; SMT; CER; 22 PF; 100V	1
C3	CS0150-	CAP; SMT; CER; 15pf; 100V; 1206	1
C30	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C31	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C32	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C33	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C34	CX0105-	CAP; SMT; TANT 1.0 uF; 35 V	1
C35	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C36	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C37	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C38*	CF4733-	CAPACITOR; FILM .047/63V	1
C39	CS0333-	CAP; SMT; CER; .033 uF; 100V; 1206	1
C4	CS0150-	CAP; SMT; CER; 15pf; 100V; 1206	1
C40	CS0103-	CAP; SMT; CER; .01 uF; 100V; 1206	1
C41	CX0105-	CAP; SMT; TANT 1.0 uF; 35 V	1
C42	C60102-	CAP; SM; 1000 Pf	1

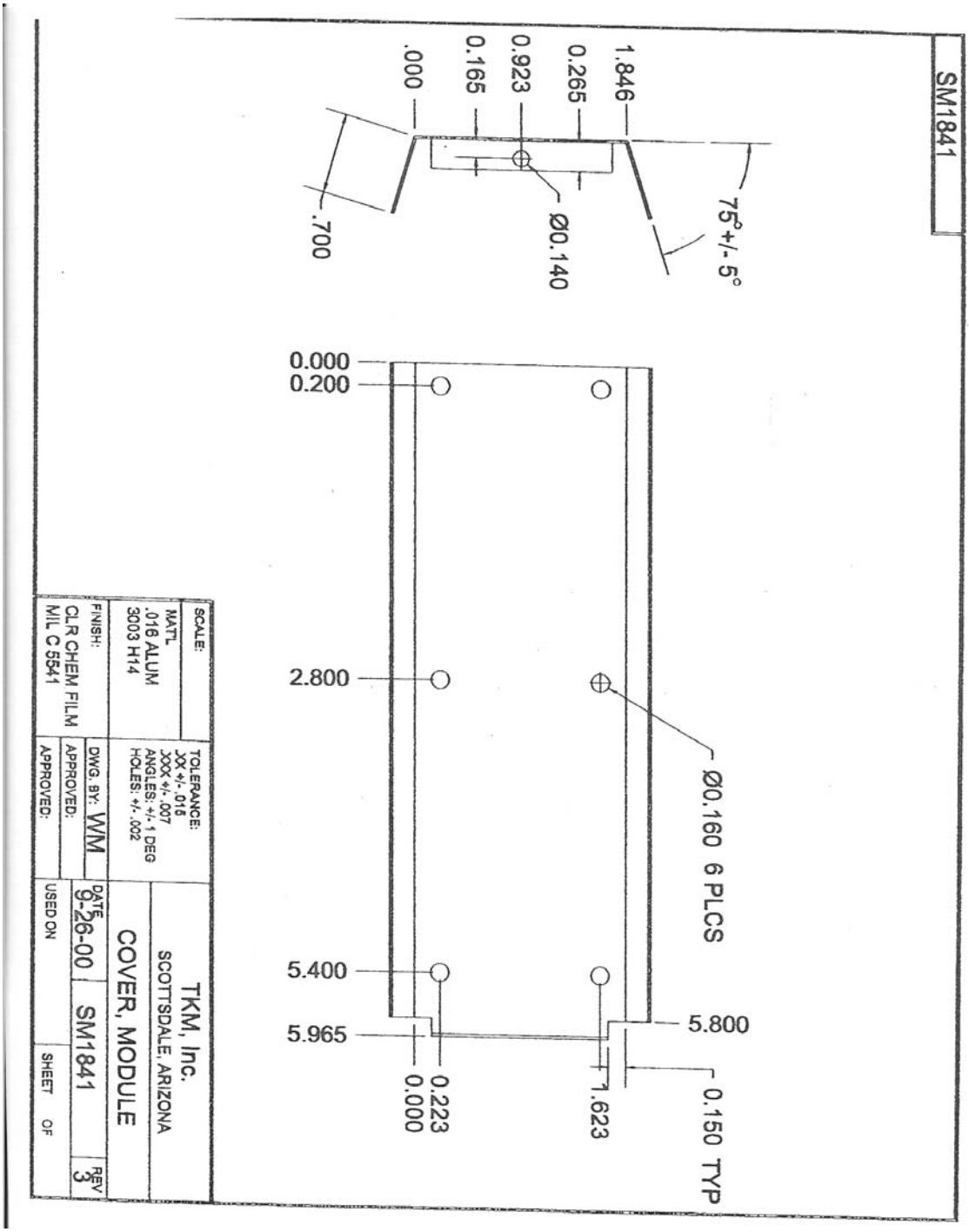
* indicates parts requiring soldermask.

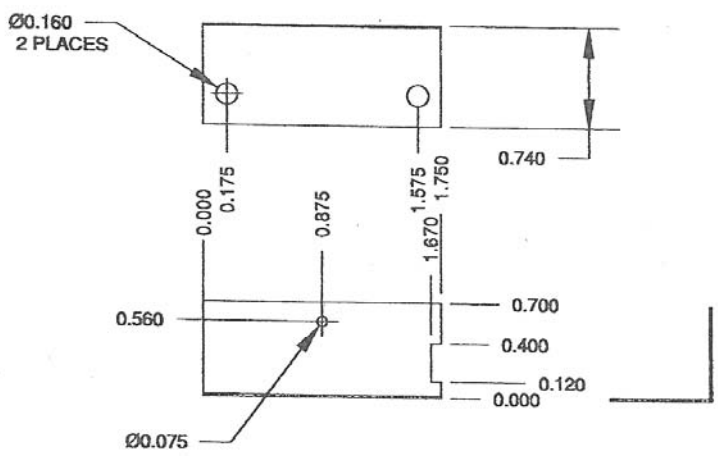
Ref #	Part #	Description	Qty
C43	CS0150-	CAP; SMT; CER; 15pf; 100V; 1206	1
C44	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C45*	CR1024-	CAP; MONO-CERAMIC .001uF; 100V	1
C46	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C47	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
C48	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C49	CS0224-	CAP; SMT; CER; .22 uF; 50 V; 1206 case	1
C5	CS0150-	CAP; SMT; CER; 15pf; 100V; 1206	1
C6	CS0150-	CAP; SMT; CER; 15pf; 100V; 1206	1
C7	CS0181-	CAP; SMT; CER; 180PF; 100V; 1206	1
C8	CS0181-	CAP; SMT; CER; 180PF; 100V; 1206	1
C9	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
D1	DS0109-	DIODE; SMT MMBV109	1
D10	DS0016-	DIODE; SMT SWITCHING	1
D11	DS3401-	DIODE; SMT MMBV3401	1
D12	DS3401-	DIODE; SMT MMBV3401	1
D13	DS0016-	DIODE; SMT SWITCHING	1
D15	DS5230-	DIODE; SMT 1N5230; SMT	1
D2	DS0109-	DIODE; SMT MMBV109	1
D3	DS0109-	DIODE; SMT MMBV109	1
D4	DS0109-	DIODE; SMT MMBV109	1
D5	DS3401-	DIODE; SMT MMBV3401	1
D6	DS3401-	DIODE; SMT MMBV3401	1
D7	DS0101-	DIODE; SMT MMBD101	1
D8	DS0101-	DIODE; SMT MMBD101	1
L1*	LFS4TN-	INDUCTOR; FIXED	1
L10	LS02R2-	IND; FIXED; SMT 2.2 uH; 10%; SMT	1
L11	LS02R2-	IND; FIXED; SMT 2.2 uH; 10%; SMT	1
L12	LS02R2-	IND; FIXED; SMT 2.2 uH; 10%; SMT	1
L13*	LA1701-	COIL/COILFORM 3.3 uH; RX	1
L14	LS0270-	IND; FIXED; SMT 27 uH; 10% SMT	1
L15	LS0270-	IND; FIXED; SMT 27 uH; 10% SMT	1
L16	LS03R3-	IND; FIXED; SMT 3.3 uH; 10%; SMT	1
L17	LS03R3-	IND; FIXED; SMT 3.3 uH; 10%; SMT	1
L19	LS03R3-	IND; FIXED; SMT 3.3 uH; 10%; SMT	1
L2*	LFS4TN-	INDUCTOR; FIXED	1
L20	LS03R3-	IND; FIXED; SMT 3.3 uH; 10%; SMT	1
L3*	LFS5TN-	INDUCTOR; FIXED	0
L4*	LFS5TN-	INDUCTOR; FIXED	0
L5	LS03R3-	IND; FIXED; SMT 3.3 uH; 10%; SMT	1
L6	LS03R3-	IND; FIXED; SMT 3.3 uH; 10%; SMT	1
L7	LS03R3-	IND; FIXED; SMT 3.3 uH; 10%; SMT	1
L8	LS03R3-	IND; FIXED; SMT 3.3 uH; 10%; SMT	1
L9	LS0270-	IND; FIXED; SMT 27 uH; 10% SMT	1



RECEIVER, NAV SS1867 REV.C

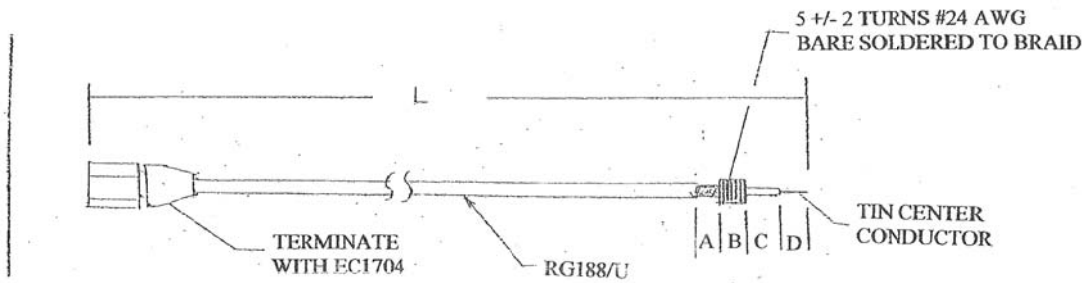

SM1840
0.080 TYP
0.000
0.560
3.160
5.760
6.160
Ø0.160 7 PLCS
0.000
0.268
1.668
1.936
Ø0.250 2 PLCS
0.130
0.000
0.450
0.740
0.590
0.000
0.810
0.988
1.330
1.660
SCALE:
MATL .031 ALUM 5052 H32
TOLERANCE: .XX +/- .015 .XXX +/- .007 ANGLES: +/- 1 DEG HOLES: +/- .002
FINISH: CLR CHEM FILM, CL 3, FORM 1, METH C
DWG. BY: WM
APPROVED:
APPROVED:
DATE 10-09-00
USED ON
TKM, Inc.
SCOTTSDALE, ARIZONA
CASE, MODULE
SM1840
REV 3
SHEET 1 OF 1


SM1841
1.846
0.265
0.923
0.165
.000
.700
Ø0.140
75° +/- 5°
0.000
0.200
2.800
5.400
5.965
Ø0.160 6 PLCS
5.800
1.623
0.223
0.000
0.150 TYP
SCALE:
MATL
.016 ALUM
3003 H14
TOLERANCE:
XX +/- .015
XXX +/- .007
ANGLES: +/- 1 DEG
HOLES: +/- .002
FINISH:
CLR CHEM FILM
MIL C 5541
DWG. BY: WM
APPROVED:
APPROVED:
DATE
9-26-00
TKM, Inc.
SCOTTSDALE, ARIZONA
COVER, MODULE
SM1841
REV
3
USED ON
SHEET OF



SM1812	SCALE	TOLERANCES .XX +/- .015 .XXX +/- .007 ANGLES +/- 1 DEG FRACT +/- 1/32	TKM, Inc SCOTTSDALE, ARIZONA
	MAT'L HALF HARD BRASS		BRACKET, GROUNDING
	FINISH BRIGHT TIN	DRAWN BY WM APPROVED APPROVED	DATE 8-9-99 / SM1812 / REV 2 USED ON / SHEET 1 OF 1

CA1803



NOTES:

DIMENSION(OPEN END)

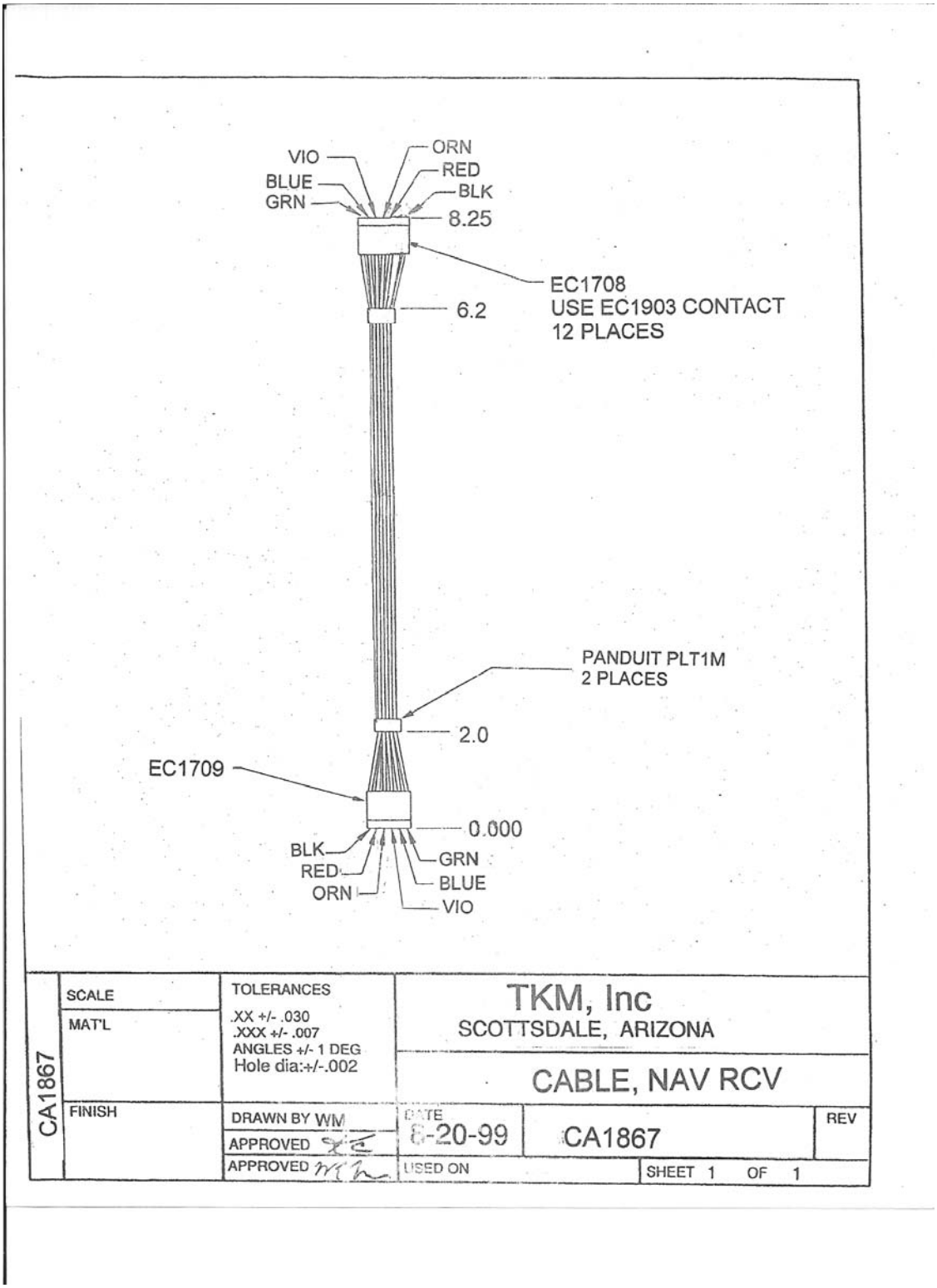
A = .600 +/- .02
B = .100 +/- .02
C = .240 +/- .20
D = .220 +/- .20

DIMENSION(TERMINATED END)

A = .640 +/- .02
B = .140 +/- .02
C = .200 +/- .02
D = .220 +/- .02

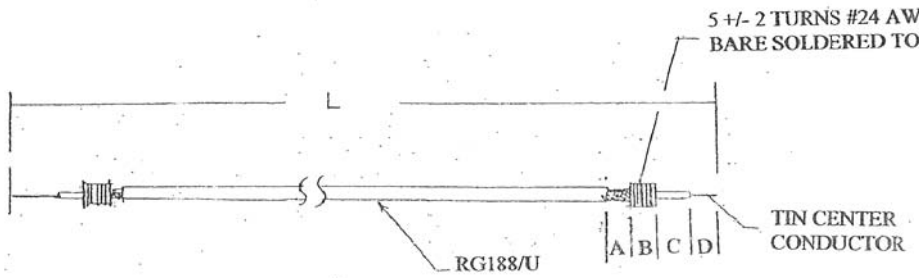
L = 7.50 =/- .040

SCALE:	TOLERANCE:	TKM, Inc. SCOTTSDALE, ARIZONA	
MAT'L		CABLE ASSY, COAX	
FINISH:	DWG. BY: WM	DATE 5-10-94 CA1803	REV
	APPROVED:	USED ON SS1866 SS1867	SHEET 1 OF 1
	APPROVED:		



CA1867	SCALE	TOLERANCES .XX +/- .030 .XXX +/- .007 ANGLES +/- 1 DEG Hole dia:+/-.002	TKM, Inc SCOTTSDALE, ARIZONA	
	MAT'L		CABLE, NAV RCV	
	FINISH	DRAWN BY WM	DATE 8-20-99	CA1867 REV
		APPROVED		
		APPROVED	USED ON	SHEET 1 OF 1

CA1804



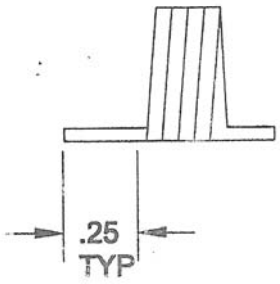
NOTES:
1. PREP EACH END THE SAME

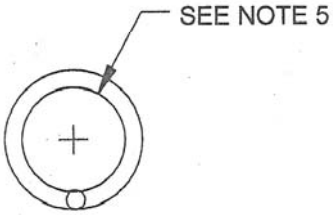
DIMENSION
A = .640 +/- .02
B = .140 +/- .02
C = .200 +/- .02
D = .220 +/- .02
L = 8.50 +/- .40

TERMINATE COMM(1 END ONLY)
ALL RADIOS, USE EC1704

TERMINATE NAV(1 END ONLY)
MX11----------EC1704
MX12----------EC2021 (HM1602)
MX170()----------EC1022 (HM1730)
MX300----------EC1704
MX385-EC1804 (HM1904)(HM1905)

SCALE:	TOLERANCE:	TKM, Inc. SCOTTSDALE, ARIZONA
MAT'L		CABLE ASSY, COAX
FINISH:	DWG. BY: WM	DATE 5-10-94 CA1804 REV
	APPROVED:	USED ON SS1866 SS1867 SHEET 1 OF 1
	APPROVED:	

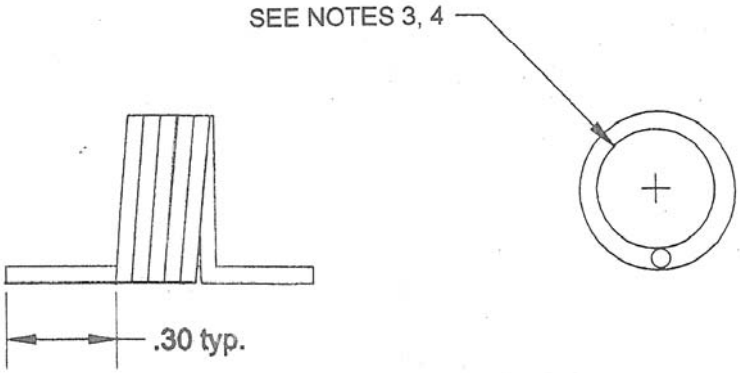




NOTES:

1. 4 TURNS CLOSE WOUND.
2. STRIP BOTH ENDS .200
3. FOR SS1866 & SS1867, USE GREEN #20 AWG SPN.
4. FOR SS1881, USE RED #18 AWG SPN.
5. ID
   SS1866 = .155
   SS1867 = .165
   SS1881 = .125

LFS4TN	SCALE	TOLERANCES	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L	.XXX +/- .015 ANGLES +/- 1 DEG Hole dia:+/-.002	INDUCTOR, RF		
	FINISH	DRAWN BY WM	DATE 7-7-00	LFS4TN	REV
		APPROVED			
		APPROVED	USED ON SS1866,SS1867,SS1881	SHEET 1 OF 1	



NOTES:

1. 5 TURNS CLOSE WOUND
2. STRIP BOTH ENDS .200
3. FOR NAV RECEIVER, ID IS .165
4. FOR COMM RECEIVER, ID IS .155

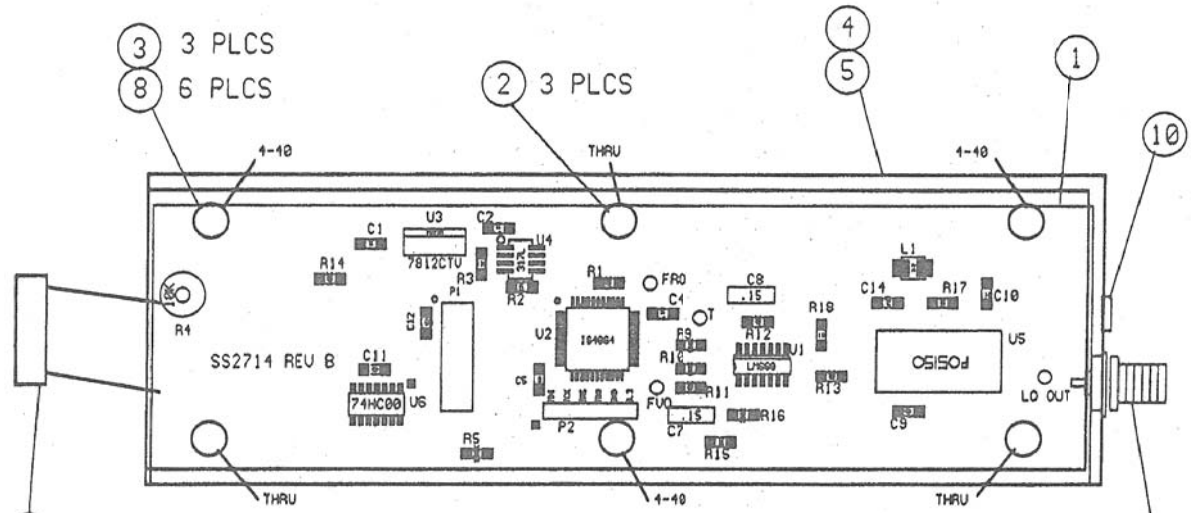
LFS5TN	SCALE	TOLERANCES	TKM, Inc SCOTTSDALE, ARIZONA		
	MAT'L 20 AWG SPN, RED	.XXX +/- .015 ANGLES +/- 1 DEG Hole dia:+/-.002	INDUCTOR, RF		
	FINISH	DRAWN BY WM	DATE 7-7-00	LFS5TN	REV
		APPROVED WM			
		APPROVED	USED ON SS1866, SS1867	SHEET 1 OF 1	

INDENTURED DRAWING LIST

MODULE SS2714 – NAV SYNTHESIZER

SS2714 REV B		COMM SYNTHESIZER ASSY
PC2714	REV B	PCB, SYNTHESIZER; COMM
SM1840	REV 3	CASE, MODULE
SM1841	REV 3	COVER, MODULE
NB400I	NONE	INSERT, EXTENDED

TKM, INC. SCOTTSDALE, AZ	NAME NAV SYNTHESIZER	PART # SS2714	REV B
Parts identified with "*" in parts list shall have pads solder masked. Wave soldering shall be in accordance with WSP002. Hand soldering shall be in accordance with WSP001.	DATE 12-20-04	APPR	APPR
		DRAWN BY: WM	



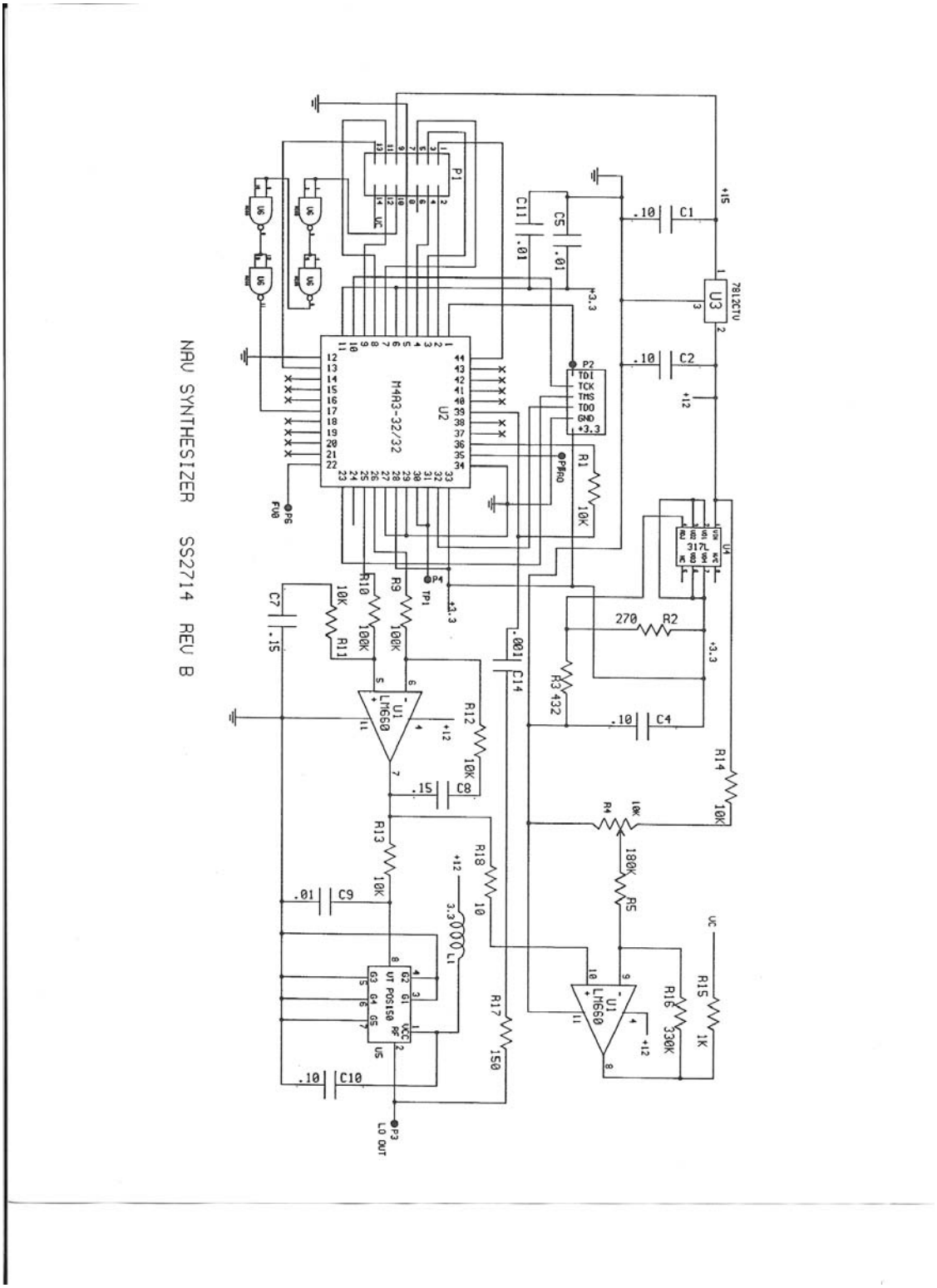
NAV SYNTHESIZER SS2714 REV B

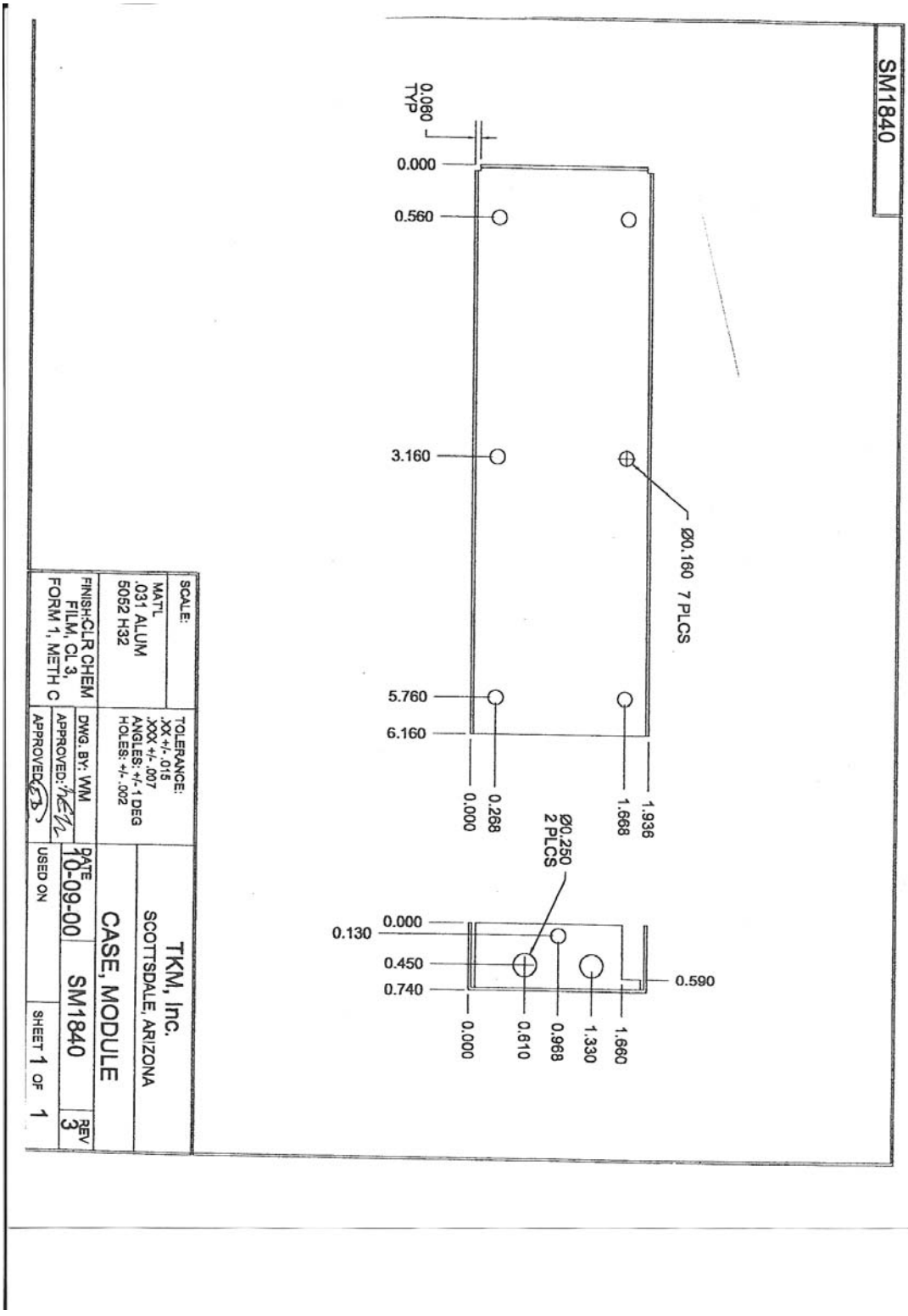
MOUNT BOARD WITH 3 4-40 X 3/16 FLAT HEAD SCREWS(NB403F).
ATTACH COVER WITH 3 4-40 X 3/16 FLAT HEAD SCREWS AND ONE 4-40 X 3/16 PAN HEAD SCREW

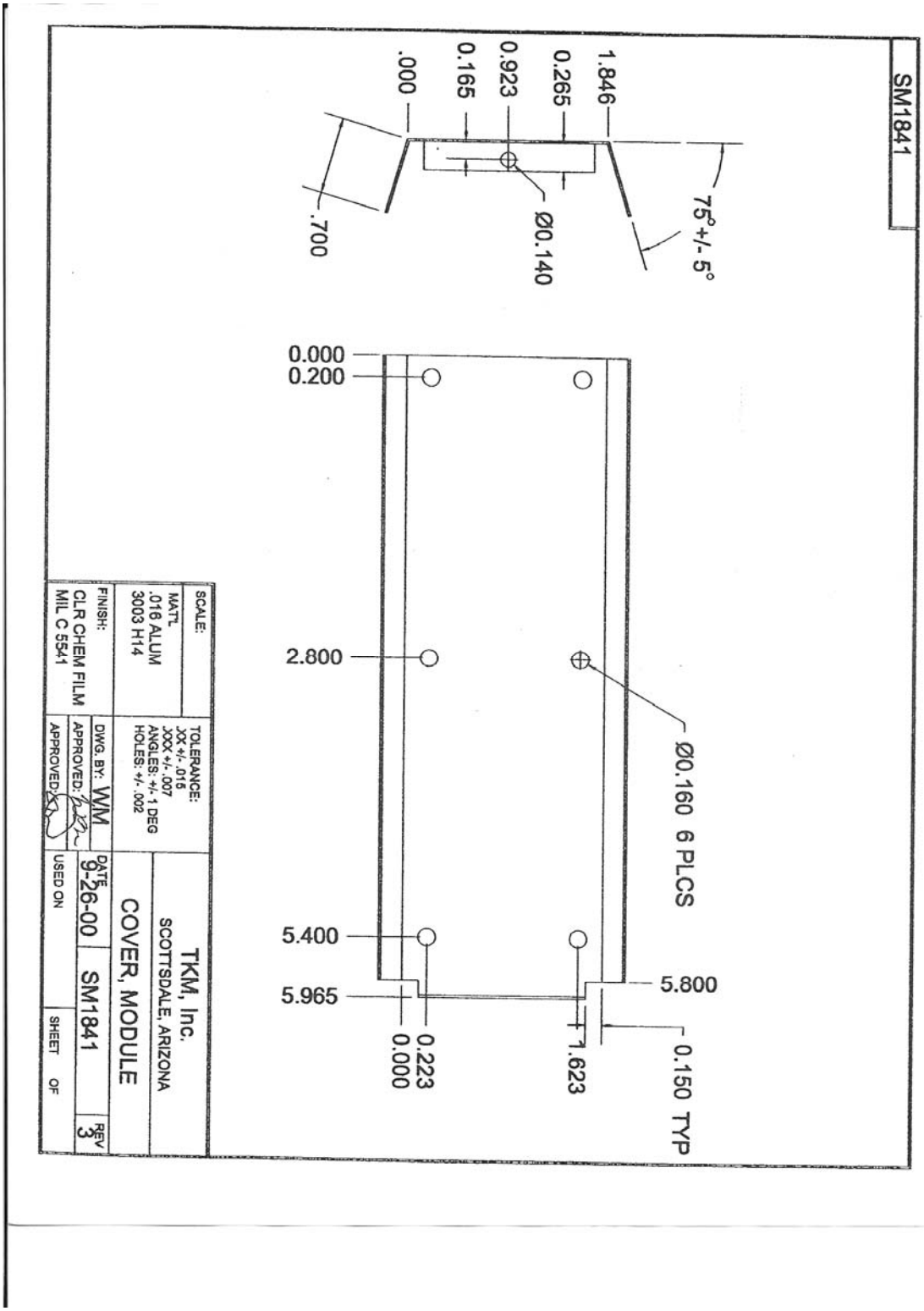
NAV SYNTHESIZER SS2714-B page 1

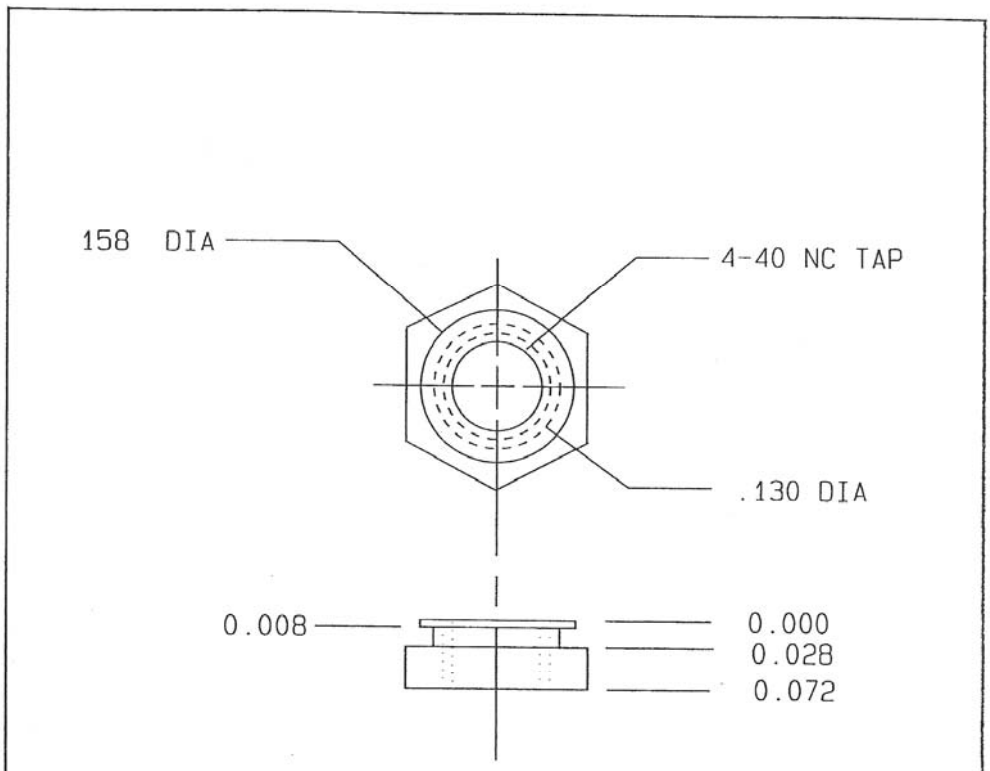
* indicates parts requiring soldermask.

Ref #	Part #	Description	Qty
01	PC2714-B	PCB SYNTHESIZER; NAV	1
02*	HS1815-3	SPACER STANDOFF; THRU HOLE	1
03*	HS1816-2	SPACER STANDOFF; 4-40 THD	1
04*	SM1840-3	SHEET METAL CASE; MODULE	1
05*	SM1841-3	SHEET METAL COVER; MODULE	1
06*	EC1703-	CONNECTOR CONN; SMA; PANEL MT.	1
07*	EC1002-	CONNECTOR 14 PIN; RIBBON CONN	1
08*	NB403F-	FASTENERS 4-40x3/16 P100 SS	1
09*	MP1053-	MISC. PARTS PIN HEADERS; GOLD; DUAL ROW	1
10*	NB403P-	FASTENERS 4-40x3/16 PP SS	1
C01	CS0104-	CAP; SMT; CER; .1 UF 1206	1
C02	CS0104-	CAP; SMT; CER; .1 UF 1206	1
C04	CS0104-	CAP; SMT; CER; .1 UF 1206	1
C05	CS0103-	CAP; SMT; CER; .01 uF; 100V; 1206	1
C07*	CF1543-	CAPACITOR; FILM .15/63V	1
C08*	CF1543-	CAPACITOR; FILM .15/63V	1
C09	CS0103-	CAP; SMT; CER; .01 uF; 100V; 1206	1
C10	CS0104-	CAP; SMT; CER; .1 UF 1206	1
C11	CS0103-	CAP; SMT; CER; .01 uF; 100V; 1206	1
C12	CS0560-	CAP; SMT; CER; 56 pF; 50 V	1
C14	CS0102-	CAP; SMT; CER; .001 uF; 100V; 1206	1
L1	LS03R3-	IND; FIXED; SMT 3.3 uH; 10%; SMT	1
P1*	ECGP14-	CONNECTOR 14 PIN Board Plug	1
R01	RS0103-	RES; SMT; FILM; 10K; 1/4W 5%; 1206	1
R02	RS0271-	RES; SMT; FILM; 270 OHM;1/4W 5%;1206	1
R03	RS4320-	RES; SMT; FILM; 432 ohm; 1206	1
R04*	PW0103-	Top Adj. .3 dia 10 K	1
R05	RS0184-	RES; SMT; FILM; 180K 5%; 1206	1
R09	RS0104-	RES; SMT; FILM; 100K; 1/4W 5%;1206	1
R10	RS0104-	RES; SMT; FILM; 100K; 1/4W 5%;1206	1
R11	RS0103-	RES; SMT; FILM; 10K; 1/4W 5%; 1206	1
R12	RS0103-	RES; SMT; FILM; 10K; 1/4W 5%; 1206	1
R13	RS0103-	RES; SMT; FILM; 10K; 1/4W 5%; 1206	1
R14	RS0103-	RES; SMT; FILM; 10K; 1/4W 5%; 1206	1
R15	RS0102-	RES; SMT; FILM; 1K; 1/4W 5%; 1206	1
R16	RS0334-	RES; SMT; FILM; 330K, 1/4 W, 1206	1
R17	RS0151-	RES; SMT; FILM; 150 OHM; 5%; 1206	1
R18	RS0100-	RES; SMT; FILM; 10 OHM; 5%; 1206	1
U1	IS0660-	INT. CKT.; SMT LM660 QUAD OP AMP	1
U2	IS4064-	INT. CKT.; SMT CPLD, 5nsec; 3.3V; MACH4000V	1
U3*	IM7812-	INT. CKT.; MISC. REGULATOR; 12V 7812	1
U4	IS317L-	INT. CKT.; SMT VOLTAGE REG	1
U5*	XT1500-	CRYSTAL; QUARTZ VCO, 75 to 150 MHz	1
U6	IS7400-	INT. CKT.; SMT QUAD NAND GATE	1


NAV SYNTHESIZER SS2714 REV B
M4A3-32/32
U2
LM660
U1
317L
U4
78L12CTU
U3
P1
P2
P3
P4
P5
P6
TP1
R1
10K
R2
270
R3
432
R4
10K
R5
180K
R9
100K
R10
10K
R11
10K
R12
10K
R13
10K
R14
10K
R15
1K
R16
330K
R17
150
R18
10
C1
.10
C2
.10
C4
.10
C5
.01
C7
.15
C8
.15
C9
.01
C10
.10
C11
.01
C14
.001
L1
3.3000
+15
+12
+3.3
VC
LO OUT

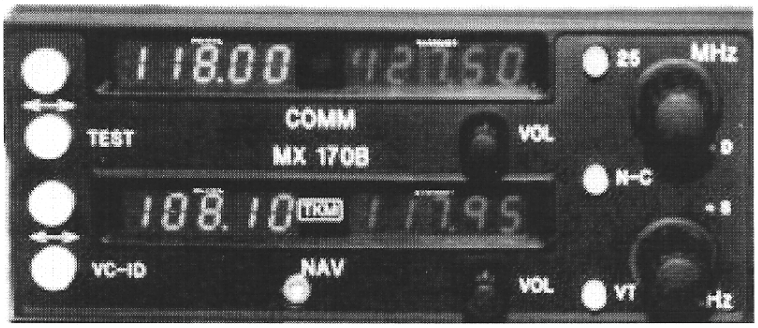

SM1840
0.080 TYP
0.000
0.560
3.160
5.760
6.160
Ø0.160 7 PLCS
0.000
0.268
1.668
1.936
Ø0.250 2 PLCS
0.130
0.000
0.450
0.740
0.590
0.000
0.610
0.968
1.330
1.660
SCALE:
MAT'L .031 ALUM 5052 H32
TOLERANCE: .XX +/- .015 .XXX +/- .007 ANGLES: +/- 1 DEG HOLES: +/- .002
FINISH: CLR CHEM FILM, CL 3, FORM 1, METH C
DWG. BY: WM
APPROVED:
APPROVED
DATE 10-09-00
TKM, Inc.
SCOTTSDALE, ARIZONA
CASE, MODULE
USED ON
SM1840
REV 3
SHEET 1 OF 1


SM1841
1.846
0.265
0.923
0.165
.000
.700
Ø0.140
75° +/- 5°
0.000
0.200
2.800
5.400
5.965
Ø0.160 6 PLCS
5.800
7.623
0.223
0.000
0.150 TYP
SCALE:
MATL
.016 ALUM
3003 H14
FINISH:
CLR CHEM FILM
MIL C 5541
TOLERANCE:
XX +/- .015
XXX +/- .007
ANGLES: +/- 1 DEG
HOLES: +/- .002
DWG. BY: WM
APPROVED:
APPROVED:
DATE
9-26-00
USED ON
TKM, Inc.
SCOTTSDALE, ARIZONA
COVER, MODULE
SM1841
REV
3
SHEET
OF



	SCALE 8X	TOLERANCE .XX +/- .005 .XXX +/- .002 ANGLES +/- 1 DEG. FRACT. +/- 1/32	TKM, INC. SCOTTSDALE, AZ
	MAT'L 3/16 SS ROD		INSERT, EXTENDED
	FINISH	DRAWN BY WEM	DATE 4-5-99 NB400I REV
		APPROVED	USED ON SHEET OF
		APPROVED	

MX170(B/C) QUICK OPERATION GUIDE



Controls & Indicators

Control	Use – Normal	Use – Edit
Top Left ←→ COMM F-F	Flips Active and Standby COMM frequencies	Next preset
TEST	Squelch	Previous preset
Lower Left ←→ NAV F-F	Flips Active and Standby NAV frequencies	Insert preset
VC-ID	NAV Voice filter	Delete preset
COMM Displays	Left is Active Right is Standby (Note: Tic to upper left of 121.50)	
Upper VOL knob	Power off/on, COMM volume	
NAV Displays	Left is Active Right is Standby	
Lower VOL knob	NAV power off/on, NAV volume	
25	Adds 25 KHz to Standby COMM frequency	
N-C	Toggle selection knobs between Standby NAV and COMM	
VT		Select edit mode on power up
MHz knob	Alter MHz setting on Standby display with Tic	
KHz knob	Alter KHz setting on Standby display with Tic	

Basic Operation

Refer to the photo for placement of the controls and displays.

The left hand COMM readout indicates the active COMM frequency; the right hand readout indicates the standby one.

The left hand NAV readout indicates the active NAV frequency; the right hand readout indicates the standby one.

A "Tic" readout is provided on the upper left hand corner of the first digit of each of the four frequency readouts. The meaning of each Tic is –

Position	Indication
Active COMM	Transmitting
Standby COMM	Selection knobs control COMM standby frequency
Active NAV	NAV is in Ident mode
Standby NAV	Selection knobs control NAV standby frequency

Note that the standby Tics are, therefore, mutually exclusive. The Tic indicates which frequency may be altered.

Power Application. The COMM volume control contains the master power switch and activates both COMM and NAV functions. Power off is fully counter-clockwise. The NAV volume control contains a power switch for remote NAV units.

Frequency Selection. The N-C button toggles between COMM or NAV standby frequency selection. The frequency under control is indicated by the Tic. The MHz and KHz controls can then be used to select a desired standby channel. When selecting a standby COMM frequency, the 25 button is used to advance the frequency by 25 KHz.

After the desired frequency is entered into the standby position, it may be transferred to the active position by pressing the flip-flop button between the two displays. Active and standby will be interchanged each time the button is pressed.

Ident/Voice Selection. The VC-ID button can be used to select a filter in order to receive voice signals on the NAV receiver. Its status is indicated by the Active NAV Tic. This switch is also used for frequency storage (see below).

Test. The TEST button is a dual function switch. In normal operation, it is used to override the squelch. This will verify receiver operation. It will also allow the reception of weak signals. It is also used in frequency storage (see below).

Transmit. The transmit mode on the COMM transceiver is selected by grounding the Mic Key line to the unit. This is achieved by pressing the PTT button on either the pilot or co-pilot yoke, the PTT button on a hand-held microphone, or the PTT button on a connected remote intercom.

Advanced Operation

The MX170B allows up to 50 NAV and 50 COMM frequencies to be stored in memory for recall. These preset frequencies remain in memory after the unit is powered down.

Clear Presets. To erase all frequency presets, turn on power to the unit while depressing the TEST button. Once reset, both COMM Active and Standby frequencies will be set to 121.5 MHz. NAV will be set to 112.0 MHz.

EDIT Mode. To enter EDIT mode, power up the unit while depressing the VT button. When in this mode, frequency presets may be examined, changed, inserted, or deleted. EDIT mode operations are performed on either the COMM or NAV preset list, according to where the tuning Tic is displayed. Pressing the N-C button toggles between the NAV and COMM positions.

Examine Presets. Pressing the COMM F-F button will step to the next frequency in the preset list. The list wraps round so that the next frequency after the last one is the first one. Pressing TEST will step to the previous frequency in the list.

Change Presets. Display the frequency to be changed. Dial in the new frequency using the selection knobs. Press either COMM F-F or TEST.

Insert Presets. Step to the frequency before the point at which the new one should be inserted. Dial in the new frequency. Press NAV F-F.

Delete Presets. Step to the frequency to be deleted. Press VC-ID to remove this frequency from the list. If there is only 1 frequency in the list, it will not be deleted.

Use Presets - COMM. When in normal operation, COMM presets can be called into the standby display by pressing COMM F-F and TEST together. While the buttons are pressed, the reference number is displayed in the Active frequency display. Each time the two buttons are pressed, the next preset in the list will be loaded into Standby.

Use Presets – NAV. NAV preset operation is similar to COMM, Presets are loaded into NAV standby by pressing NAV F-F and VC-ID together.