



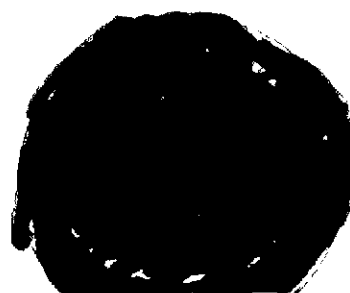
Final Report

LOW COST GROUND RECEIVING SYSTEMS FOR TELEVISION SIGNALS FROM HIGH-POWERED COMMUNICATIONS SATELLITES

VOLUME II - PARTS LIST AND ENGINEERING DRAWINGS

NASA——CR 120933

J. P. Hesler
Y. C. Hwang
J. J. Zampini



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FROM HIGH-POWERED COMMUNICATIONS
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Prepared by
Electronics Laboratory
GENERAL ELECTRIC COMPANY
Syracuse, N. Y.

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REFERENCE DRAWINGS AND PARTS LIST

2.25 GHZ FM INDOOR UNIT ASSEMBLY

SK 56157-E91-103

Reference Drawings

Chassis Assembly	D91-84
Facades	D91-114
Cover Assembly	C91-85
Interlock Cord Bracket	B91-82
Angle	B91-81
IF Amplifier-Discriminator Board Assy	E91-64
IF Amplifier-Discriminator Board Schematic	E91-56
Power Supply-Remodulator Board Assembly	E91-118
Power Supply-Remodulator Board Schematic	E91-117

Parts List for Assembly

- 1) Chassis Assembly (Fabricate Per Drawing - D91-84)
 - 1) Chassis (FPD D91-84)
 - 2) Press in studs (2) #4-40 x 5/16"
 - 3) Front Facade (FPD-D91-114 P1)
 - 4) Rear Facade (FPD-D91-114 P2)
 - 5) Facade Overlay (FPD-D91-114 P8)
 - 6) Receptacle, AC, Newark Electronics #36F881

- 2) Cover Assembly
 - 1) Cover (FPD-C91-85)
 - 2) Interlock Cord Bracket (FPD-B91-82)
 - 3) Vinyl Contact Paper

- 3) Angle (2), (FPD B91-81)
- 4) IF Amplifier-Discriminator Board Assy (See Parts List)
- 5) Power Supply-Remodulator Board Assy (See Parts List)
- 6) Power Transformer, Electronics Component Corp, #X44-5315
- 7) Fuse Clip, Bussman Mfg. Co., #3828-1
- 8) Neon Lamp, Chicago Miniature Lamp, #CM22-1000-00-A1A
- 9) Switch, 3PDT, Continental Wint, 3.0A, 125V
- 10) Interlock Cord, G. E. Co. MTD
- 11) Terminal Strip, H. H. Smith #906
- 12) Clip Nut (4), Shur-Lok, #SL 213-06-1
- 13) Rubber Foot (4), H. H. Smith, #2197
- 14) Spacer (6), H. H. Smith, #8428
- 15) Spacer (6), H. H. Smith #2100
- 16) Fuse, 8AG, 1/4A
- 17) Choke (2) 24 Turns, #26 enameled wire wound on 2.7K, 1W resistor

IF Amplifier-Discriminator Board Parts List

Printed circuit board (FPD-E91-64)

C1	0.001 μ f, 150V DC, disc
C2	0.001 μ f, 150V DC, disc
C3	0.001 μ f, 150V DC, disc
C4	0.001 μ f, 150V DC, disc
C6	0.001 μ f, 150V DC, disc
C7	0.001 μ f, 150V DC, disc
C8	0.001 μ f, 150V DC, disc
C10	0.001 μ f, 150V DC, disc
C11	0.001 μ f, 150V DC, disc
C12	0.001 μ f, 150V DC, disc
C14	0.001 μ f, 150V DC, disc
C15	0.001 μ f, 150V DC, disc
C16	0.001 μ f, 150V DC, disc
C19	0.001 μ f, 150V DC, disc
C20	0.001 μ f, 150V DC, disc
C5	1.7-6 pf, JFD Electronics, DFJ301
C9	1.7-6 pf, JFD Electronics, DFJ301
C21	1.7-6 pf, JFD Electronics, DFJ301
C13	2.7-20 pf, JFD Electronics, DVJ300A
C17	2.7-20 pf, JFD Electronics, DVJ300A
C22	2.7-20 pf, JFD Electronics, DVJ300A
C23	2.7-20 pf, JFD Electronics, DVJ300A
C18	20 pf, duramica
C24	75 pf, duramica
CR1	Hot carrier diode, HPA-5082-2811
CR2	Hot carrier diode, HPA-5082-2811
L1	Coils printed on circuit board
L2	Coils printed on circuit board
L3	Coils printed on circuit board
L4	Choke, 1 μ h, National #R-33-1
L5	Choke, 1 μ h, National #R-33-1
L6	Coils printed on circuit board
L7	Coils printed on circuit board
L8	Coils printed on circuit board
L9	Coils printed on circuit board
L10	Coils printed on circuit board
L11	Coils printed on circuit board
Q1	2N4996, TI, rejects from low noise figure selection process.
Q2	2N4996, TI, rejects from low noise figure selection process.
Q3	2N4996, TI, rejects from low noise figure selection process.
Q4	2N4996, TI, rejects from low noise figure selection process.
Q5	2N4996, TI, rejects from low noise figure selection process.
Q6	2N4996, TI, rejects from low noise figure selection process.

R1 82 Ω , 1/2w, 10%
 R2 10K, 1/2w, 10%
 R3 22K, 1/2w, 10%
 R4 1.2K, 1/2w, 10%
 R5 150 Ω , 1/2w, 10%
 R6 10K, 1/2w, 10%
 R7 10K, 1/2w, 10%
 R8 1.2K, 1/2w, 10%
 R9 150 Ω , 1/2w, 10%
 R10 10K, 1/2w, 10%
 R11 10K, 1/2w, 10%
 R12 820 Ω , 1/2w, 10%
 R13 150 Ω , 1/2w, 10%
 R14 10K, 1/2w, 10%
 R15 10K, 1/2w, 10%
 R16 220 Ω , 1/2w, 10%
 R17 680 Ω , 1/2w, 10%
 R18 27 Ω , 1/2w, 10%
 R19 27 Ω , 1/2w, 10%
 R20 27 Ω , 1/2w, 10%
 R21 5K, Potentiometer, Type MTC-L4, Allied #46D3674C
 R22 1K, 1/2w, 10%
 R23 100 Ω , 1/2w, 10%
 R24 330 Ω , 1/2w, 10%
 R25 120 Ω , 1/2w, 10%
 R26 120 Ω , 1/2w, 10%
 T1 Balun, G. E. MTD #23C220346-2
 T2 Printed transformers on circuit board
 T3 Printed transformers on circuit board
 T4 Printed transformers on circuit board
 T5 Printed transformers on circuit board

Power Supply-Remodulator Circuit Board Parts List

C1 15 μ f 25V, tantalum
 C3 25 μ f, 25 V, tantalum
 C4 15 μ f, 25 V, tantalum
 C5 36 pf, duramica
 C8 0.001 μ f, 150V DC, disc
 C9 0.001 μ f, 150V DC, disc
 C10 33 pf, duramica
 C11 91 pf, duramica
 C12 2.7-20 pf, JFD Electronics, DVJ-300A
 C13 500 μ f, 50V, tantalum
 C14 100 μ f, 50V, tantalum
 CR-1 Diode 1N914

CR-2 Rectifier Diode. General Electric A14A
 CR-3 Rectifier Diode. General Electric A14A
 CR-4 Rectifier Diode. General Electric A14A
 CR-5 Rectifier Diode. General Electric A14A

 L1 9 turns #22 solid wire, 1/4" ID, natural set
 Carbonyl slug cemented in center.

 L2 Line choke General Electric Co., MTD

 L3 Choke, Miller 25 μ h

 Q1 2N4996, T. I. rejects from low noise figure selection process
 Q2 2N4996, T. I. rejects from low noise figure selection process
 Q4 2N4996, T. I. rejects from low noise figure selection process
 Q5 2N4996, T. I. rejects from low noise figure selection process
 Q6 2N4996, T. I. rejects from low noise figure selection process

 Q7 2N3417, Selected for V_{BE} breakdown of $9V \pm 0.5 V$ and
 good zener characteristics
 Q8 2N3417, Selected for V_{BE} breakdown of $9V \pm 0.5 V$ and
 good zener characteristics
 Q9 2N3417, Selected for V_{BE} breakdown of $9V \pm 0.5 V$ and
 good zener characteristics
 Q10 D28C1, Power Darlington, General Electric Co.

 R1 330 , 1/2w, 10%
 R3 2.2K, 1/2w, 10%
 R8 390K, 1/2w, 10%
 R9 18K, 1/2w, 10%
 R10 27K, 1/2w, 10%
 R11 220 , 1/2w, 10%
 R12 22K, 1/2w, 10%
 R13 56 Ω , 1/2w, 10%
 R14 2.7K, 1/2w, 10%
 R15 15K, 1/2w, 10%
 R16 100 , 1/2w, 10%
 R17 4.7K, 1/2w, 10%
 R18 1K, 1/2w, 10%
 R20 290 , 1/2w, 10%
 R21 180 , 2w, , 10%
 R22 1.3K, 1/2w, 10%
 R23 360 , 1/2w, 5%
 R24 8.3M, 1/2w, 10%
 R25 220K, 1/2w, 10%

 T2 #30 enameled wire twisted pair. 4 turns wound on ferrite
 toroid type #25-6 Amidon associates, Hollywood, Calif.

2.25 GHz FM ANTENNA UNIT ASSEMBLY, DWG. SK56157-E91-102

Reference Drawings

Enclosure Assembly	C91-112
Base Plate	C91-111P1
Mixer Assembly Drawing	D91-110
IF Amplifier Assembly	D91-107
IF Amplifier Schematic	D91-108
Oscillator Assembly	C91-113
Oscillator Box Assembly	C91-95
Nameplate	D91-114 P7

Parts List for Assembly

- 1) Enclosure (Fabricate Per Drawing) Can, Moorlee Mfg. Co., #MT1022-040-4
- 2) Baseplate, (FPD)
- 3) Mixer Board Assembly (FPD)
- 4) IF Amplifier Board Assembly (See Parts List)
- 5) Oscillator Assembly (See Parts List)
- 6) Terminal Strip, Cinch Jones #17-2
- 7) RF Connector, Sealelectro Corp. #50-962-0019
- 8) Mixer Diode (2), HPA #5082-2811 (match pairs)
- 9) Coax cable (FPD-E91-102)
- 10) Capacitor, 0.001 μ f, 150 V DC, disc
- 11) Spacer (4), H. H. Smith #2100
- 12) Hole Plug, Cinch Jones #41-C
- 13) Nameplate (FPD D91-114 P7)

Parts List for IF Amplifier Board Assembly

Printed circuit board (FPD, D91-107)

- C1 0.001 μ f, 150 V DC, disc
- C2 2.7-20 pf, JFD Electronics DVJ-300A
- C3 0.001 μ f, 150 V DC, Disc
- C4 0.001 μ f, 150 V DC, Disc
- C5 0.001 μ f, 150 V DC, Disc
- C6 2.7-20 pf, JFD Electronics, DVJ-300A
- C7 0.001 μ f, 150 V DC, Disc
- C8 0.001 μ f, 150 V DC, Disc
- C9 0.001 μ f, 150 V DC, Disc
- C10 2.7-20 pf, JFD Electronics, DVJ-300A
- C11 0.001 μ f, 150 V DC, Disc
- C12 0.001 μ f, 150 V DC, Disc
- C13 0.001 μ f, 150 V DC, Disc
- L1 3 turns #22 Solid, 1/4" ID
- L2 Printed coils on circuit board
- L3 Printed coils on circuit board
- L4 Printed coils on circuit board
- L5 1-1/2 turns, 0.031 D wire on ferrite core
Ferroxcube Corp. #5639031/4B

Q1 2N4996, Texas Instrument, selected for minimum noise figure
 Q2 2N4996, Texas Instrument, selected for minimum noise figure
 Q3 2N4996
 R1 10K, 1/2w, 10%
 R2 33K, 1/2w, 10%
 R3 1.2K, 1/2w, 10%
 R4 100Ω, 1/2w, 10%
 R5 10K, 1/2w, 10%
 R6 150Ω, 1/2w, 10%
 R7 22K, 1/2w, 10%
 R8 1.2K, 1/2w, 10%
 R9 100Ω, 1/2w, 10%
 R10 10K, 1/2w, 10%
 R11 680Ω, 1/2w, 10%
 R12 22K, 1/2w, 10%
 R13 1.2K, 1/2w, 10%
 R14 680Ω, 1/2w, 10%
 R15 1.8K, 1/2w, 10%
 T-1 Printed transformers on printed circuit board
 T-2 Printed transformers on printed circuit board
 T-3 Printed transformers on printed circuit board
 T-4 Balun, GE MTD #23622-0346-2

Parts List for Oscillator Assembly

1) Oscillator Box (FPD-C91-95)
 2) Airline Strip (FPD-C91-95)
 3) Airline Strip (FPD-C91-95)
 C2 0.001 μf feedthru, Cramer Eastern #2404-000, X5UO-102P
 C3 0.001 μf feedthru, Cramer Eastern #2404-000, X5UO-102P
 L3 Choke (FPD-C91-113)
 Q1 AT25, Avantek Corp.
 Q2 2N3417, select for V_{BE} breakdown of
 7.5 V ± 0.5 V and low zener impedance
 R1 22K, 1/2w, 10%
 R2 1.8K, 1/4w, 10%
 R3 270Ω, 1/8w, 10%
 R4 270Ω, 1/4w, 10%
 R5 1/4w, 5% select for temp compensation.
 RT-1 Thermistor, Carborundum Corp, #CO804H, 100Ω ± 10% at 25°C

2.25 GHz AM INDOOR UNIT ASSEMBLY SK56157-E91-101

Reference Drawings

Chassis	D91-79
Cover	C91-80
Angle	B91-81
Power Supply Board Assembly	D91-76
Power Supply Board Schematic	C91-77
Interlock Cord Bracket	B91-84
Facades	D91-114

Parts List for Assembly

- 1) Chassis (Fabricate Per Drawing)
- 2) Cover (FPD)
- 3) Angle (2) (FPD)
- 4) Power Supply Board (See Parts List)
- 5) Transformer, Electronic Components Co. #X44-5315
- 6) Fuse Clip, Bussman Mfg. Co., #3828-1
- 7) Lamp, Chicago Miniature Lamp, #CM22-1000-00-A1A
- 8) Switch, 3PDT, Continental Wirt, 3.0A, 125 V
- 9) Interlock Cord, General Electric MTD
- 10) Terminal Strip, H. H. Smith #906
- 11) Clip Nut (4), Shur Lock Corp., #SL-213-06-1
- 12) Rubber Foot (4), H. H. Smith #H2196
- 13) Spacer (4), H. H. Smith #2100
- 14) Fuse, 8AG, 1/4A

Parts List for Power Supply Board

- | | |
|-----|---|
| C1 | 100 μ f, 50V, tantalum, Allied #43D2970 |
| C2 | 1 μ f, 50V, tantalum, Allied #43D2855 |
| CR1 | Rectifier Diode, General Electric Co. A14A |
| CR2 | Rectifier Diode, General Electric Co. A14A |
| L1 | Line choke, General Electric Co. MTD |
| Q1 | Power Darlington, General Electric Co., D28C1 |
| Q2 | 2N3417 (Reject from zener selection process) |
| Q3 | 2N3417 (Select for reverse base emitter breakdown voltage of 7.5 V \pm 0.5 V and low zener impedance) |
| Q4 | 2N3417 (Select for reverse base emitter breakdown voltage of 7.5 V \pm 0.5 V and low zener impedance) |
| R1 | 8.2M, 1/2w, 10% |
| R2 | 4.7K, 1/2w, 10% |
| R3 | 390 Ω , 1/2w, 10% |
| R4 | 3.9K, 1/2w, 10% |
| R5 | 51 Ω , 2w, 5% |
| R6 | 220K, 1/2w, 10% |
| T-1 | Balun, GE MTD μ 23C-220346-2 |

2.25 GHz ANTENNA UNIT ASSEMBLY, DWG SK56157-E91-100

Reference Drawings for Assembly

Enclosure Assembly	C91-99
Baseplate	C91-98P1
Filter-Mixer Assembly	E91-97
Step-Recovery Diode Assembly and Schematic	C91-69
Oscillator-Tripler Board Assembly	D91-67
Oscillator-Tripler Board Schematic	D91-66
IF Amplifier Assembly and Schematic	D91-45
Spacer	A91-106P1
Nameplate	D91-114P6

Parts List for Assembly

- 1) Enclosure (Fabricate Per Drawing) Can, Moorlee Mfg. Co. , # MT1019-050-4 5/8
- 2) Baseplate (FPD)
- 3) Filter-Mixer Board (FPD)
- 4) Step Recovery Diode Board (See Parts List)
- 5) Oscillator-Tripler Board (See Parts List)
- 6) IF Amplifier Board (See Parts List)
- 7) RF Connector, Sealectro #E-50-1020
- 8) Hot Carrier Diode (2), HPA #5082-2811 Match pairs
- 9) Resistor, 82Ω , 1/8w, 10%
- 10) Resistor, $9.1\text{ M}\Omega$, 1/8w, 10%
- 11) Spacer (2), H. H. Smith #2322
- 12) Spacer (3), H. H. Smith #2101
- 13) Resistor 8.2Ω , 1/2w, 10%
- 14) Capacitor $0.001\ \mu\text{f}$, 150 V DC, Disc
- 15) Spacer (FPD)
- 16) Nameplate (FPD)
- 17) Spacer (2), H. H. Smith #2102
- 18) Terminal Strip, Cinch Jones #17-2

Auxilliary Parts Lists for 2.25 GHz AM Antenna Unit

Step-Recovery Diode Board Parts List

- 1) Printed Circuit Board (FPD)
 - 2) Connector Tab (FPD)
 - 3) Ground Strap (FPD)
 - 4) Ground Strap (FPD)
- C1 20 pf Duramica
C2 2.7-20 pf, JFD Electronics μDVJ 300A
C3 56 pf, American Technical Ceramics
#30ATC100-B-56-0-J-P
C4 1000 pf Feedthru, Cramer Eastern #2404-000 X5UO-102P
CR1 HPA 5082-0112
L1 (FPD)
L2 (FPD)
R1 510Ω , 1/4w, 5%

Oscillator-Tripler Board Parts List

- 1) Printed Circuit Board (FPD)
- C1 0.001 μ f, 150V DC, Disc
 - C2 22 pf, Duramica
 - C3 62 pf, Duramica
 - C4 0.001 μ f, 150 V DC, Disc
 - C5 0.001 μ f, 150 V DC, Disc
 - C6 1000 pf Feedthru, Cramer Eastern -2404-000-X5UO-102P
 - C7 22 pf, Duramica
 - C8 JFD Electronics DVJ-301
 - C9 0.001 μ f, 150 V DC, Disc
 - C10 33 pf, Duramica
 - C11 JFD Electronics, DVJ-300A
 - C12 1000 pf, Cramer Eastern 2404-000-X5UO-102P
 - C13 0.001 μ f, 150 V DC, Disc
 - C14 0.001 μ f, 150 V DC, Disc
 - C15 JFD Electronics, DVJ-300A
 - C16 1000 pf, Cramer Eastern 2404-000-X5UO-102P
 - C17 JFD Electronics, DVJ-300A
 - C18 10 pf, Duramica
- L1
thru Fabricate per drawings D91-66, D91-67
L11
- Q1 2 N4996 Rejects from low noise figure selection process
 - Q2 2N4996 Rejects from low noise figure selection process
 - Q3 2N3866 Select for minimum β of 30
 - Q4 2N3866 Select for minimum β of 30
- R1 10K, 1/2w, 10%, Hot molded carbon
 - R2 10K, 1/2w, 10%, Hot molded carbon
 - R3 750 Ω , 1/2w, 5%, Hot molded carbon
 - R5 330 Ω , 1/2w, 10%, Hot molded carbon
 - R6 8.2K, 1/2w, 10%, Hot molded carbon
 - R7 10K, 1/2w, 10%, Hot molded carbon
 - R8 33 Ω , 1/2w, 10%, Hot molded carbon
 - R9 470 Ω , 1/2w, 10%, Hot molded carbon
 - R10 43 Ω , 1/2w, 5%, Hot molded carbon
 - R12 15 Ω , 1/2w, 10%, Hot molded carbon
 - R13 8.2 Ω , 1/2w, 10%, Hot molded carbon
 - R14 150 Ω , 1/2w, 10%, Hot molded carbon
- Y-1 Crystal, 72.225 MHz \pm 0.05%, 5th overtone
maximum resistance 100 Ω , Series cut H-3W Holder,
J. K. Knight Co.

IF Amplifier Parts List

- 1) Printed Circuit Board (FPD)
- C1 0.001 μ f, 150 V DC, Disc
- C2 1000 pf, Cramer Eastern, 2404-000-X5UO-120P
- C3 1000 pf, Cramer Eastern, 2404-000-X5UO-102P
- C4 33 pf, Duramica
- L1 FPD (D91-45) Cores (2) Ferroxcube #563 9031/4B
- L2 FPD (D91-45) Cores (2) Ferroxcube #563 9031/4B
- Q1 2N4996 Selected for low noise figure
- R1 1.8K, 1/2w, 10%
- R2 10K, 1/2w, 10%
- R3 820 Ω , 1/2w, 10%
- R4 3.3K, 1/2w, 10%
- R5 820 Ω , 1/2w, 10%
- T1 Balun General Electric #23C220346-2

12 GHz FM ANTENNA UNIT ASSEMBLY SK56157-E91-104

Reference Drawings

Enclosure Assembly	C91-91
Baseplate Assembly	C91-89
Bracket	C91-88
Mixer Cavity Assembly	C91-96
Mixer Cavity	C91-46
Contact Probe	A91-48
Washer	A91-87
Diode Holder	A91-68
Spacer	A91-86
Cover	A91-51
Tuning Fixture	A91-109
Mixer Assembly	D91-37
Spacer Block	A91-90
IF Amplifier Assembly	D91-55
IF Amplifier Schematic	D91-54
Voltage Regulator Assy and Schematic	D91-115
Heat Sink Bracket	B91-116
Nameplate	D91-114

Antenna Unit Assembly Parts List

- 1) Enclosure
 Plate (Fabricated Per Drawing C91-91)
 Can, Zero Manufacturing Co. #Z48-80A-3 $\frac{1}{2}$ "
- 2) Baseplate (FPD-C91-89)
- 3) Bracket (FPD-C91-88)
- 4) Mixer Cavity Assembly (See Parts List)
- 5) Spacer Block (FPD-A91-90)
- 6) IF Amplifier Assembly (See Parts List)
- 7) Voltage Regulator Assembly (See Parts List)
- 8) Terminal Strip, Cinch Jones #17-2
- 9) Capacitor, 0.001 μ f, 150 V DC, disc
- 10) Terminal Lug, H. H. Smith #1416-4
- 11) Capacitor, 1 μ f, 200 V DC, Herovox #P8292ZN-10
- 12) Spacer, H. H. Smith #2100
- 13) Standoff, Whitso #3A1-A1
- 14) Hole Plug, Cinch Jones #41-B
- 15) Nameplate (FPD D91-114P5)
- 16) Resistor, 22 Ω , 1/2w, 10%
- 17) Spacer (2), H. H. Smith #8428
- 18) Spacer, H. H. Smith #2101
- 19) Mica Washer, (FPD - E91-104)

Mixer-Cavity Assembly Parts List

- 1) Cavity (FPD-D91-46)
- 2) Diode Contact (FPD-A91-48)
- 3) Washer (FPD-A91-87)
- 4) Diode, Varian Associates, VSX-9201BE
- 5) Diode Holder, (FPD-A91-68)
- 6) Probe, Alumina, 1/8" OD \times 2.50" \pm 0.04" McDaniel Refractory
- 7) Spacer (FPD-A91-86)
- 8) Cover (FPD-A91-51)
- 9) Mixer Assembly
 - 1) Circuit Board (FPD-D91-37)
 - 2) Shield Board (FPD-91-37)
 - 3) Cover (FPD-D91-37)
 - 4) RF Connector, Sealectro Corp. #50-962-0019
 - 5) Hot Carrier Diodes (2) HPA-5082-2740
 - 6) Cavity Probe (FPD-D91-37)
- 10) Tuning Fixture (FPD-A91-109)

IF Amplifier Assembly Parts List

- | | |
|-----|---|
| C2 | 0.001 μ f, 150V DC, disc |
| C4 | 0.001 μ f, 150V DC, disc |
| C5 | 0.001 μ f, 150V DC, disc |
| C6 | 0.001 μ f, 150V DC, disc |
| C7 | 0.001 μ f, 150V DC, disc |
| C9 | 0.001 μ f, 150V DC, disc |
| C11 | 0.001 μ f, 150V DC, disc |
| C13 | 0.001 μ f, 150V DC, disc |
| C14 | 0.001 μ f, 150V DC, disc |
| C15 | 0.001 μ f, 150V DC, Disc |
| C3 | 2.7-20 pf, JFD Electronics, DVJ300A |
| C8 | 2.7-20 pf, JFD Electronics, DVJ300A |
| C12 | 2.7-20 pf, JFD Electronics, DVJ300A |
| L1 | Inductors printed on circuit board |
| L2 | Inductors printed on circuit board |
| L3 | Inductors printed on circuit board |
| L5 | 3 turns #26 enameled wire, 1/4" I. D. |
| Q1 | 2N4996, T. I. Selected for minimum noise figure |
| Q2 | 2N4996, T. I. Selected for minimum noise figure |
| Q3 | 2N4996, T. I. Selected for minimum noise figure |
| R1 | 33K, 1/2w, 10% |
| R2 | 10K, 1/2w, 10% |
| R3 | 1.2K, 1/2w, 10% |
| R4 | 150 Ω , 1/2w, 10% |
| R5 | 22K, 1/2w, 10% |
| R6 | 10K, 1/2w, 10% |
| R7 | 100 Ω , 1/2w, 10% |
| R8 | 1.2K, 1/2w, 10% |
| R9 | 100 Ω , 1/2w, 10% |

R10 680 Ω , 1/2w, 10%
 R11 22K, 1/2w, 10%
 R12 10K, 1/2w, 10%
 R13 1.2K, 1/2w, 10%
 R14 680 Ω , 1/2w, 10%

 T1 Transformers printed on circuit board
 T2 Transformers printed on circuit board
 T3 Transformers printed on circuit board
 T4 Balun, G. E. Co. MTD #23C220346-2

Voltage Regulator Assembly Parts List

C1 1 μ f, 50V, tantalum
 C2 0.05 μ f, 100V, disc
 L1 1 $\frac{1}{2}$ turns, #26 solid wire on ferrite core Ferroxcube #5639031/4B
 Q1 Power Darlington, G. E. Co., D28C1
 Q2 2N3417, Selected for V_{BE} breakdown of 8.56 to 9.0V
 and good zener characteristic
 Q3 2N3417, reject from zener selection process
 R1 10 Ω , 2w, 10%
 R2 4.7K, 1/2w, 10%
 R3 3.3K, 1/2w, 10%
 R4 390 Ω , 1/2w, 10%

 L4 Same as L1

12 GHz FM INDOOR UNIT ASSEMBLY SK56157-E91-105

Reference Drawings

Chassis Assembly	D91-84
Cover	C91-85
Angle	B91-81
IF Amplifier-Discriminator Assembly	E91-64
IF Amplifier-Discriminator Schematic	E91-56
Power Supply-Remodulator Assembly	E91-72
Power Supply-Remodulator Schematic	E91-71
Facades	D91-114

Ground Unit Assembly Parts List

- 1) Chassis Assembly
 - 1) Chassis (Fabricate Per Drawing D91-84)
 - 2) Studs (2), Press-in #4-40 x 5/16"
 - 3) Front Facade (FPD-D91-114P1)
 - 4) Rear Facade (FPD-D91-114P2)
 - 5) Facade Overlay (FPS-D91-114P8)
 - 6) Interlock Cord Receptacle, Newark Electronics #36F881
- 2) Cover Assembly
 - 1) Cover (FPD-C91-85)
 - 2) Bracket (FPD-B91-82)
 - 3) Vinyl Contact Paper
- 3) Angle (2) (FPD-B91-81)
- 4) IF Amplifier-Discriminator Assembly (See Parts List)
- 5) Power Supply-Remodulator Assembly (See Parts List)
- 6) Power Transformer, Electronic Components Co. #X44-5315B
- 7) Fuse Clip, Bussman Mfg. Co., #3828-1
- 8) Neon Lamp, Chicago Miniature Lamp Co. #CM-22-1000-00-A1A
- 9) Switch 3PDT, Continental-Wirt, 3.0A, 125V
- 10) Interlock Cord, G. E. Co. MTD
- 11) Terminal Strip, H. H. Smith Co., #906
- 12) Clip-Nut (4), Shur-Lok, #SL213-06-1
- 13) Rubber Foot (4), H. H. Smith #2A7
- 14) Spacer (6), H. H. Smith, #8428
- 15) Spacer (6), H. H. Smith, #2100
- 16) Fuse, 8AG, 1/4A
- 17) Choke (2), 24 turns, #26 enameled wire wound on 2.7K, 1w resistor

IF Amplifier-Discriminator Assembly Parts List

Identical to 2.25 GHz FM unit

Power Supply-Remodulator Assembly Parts List

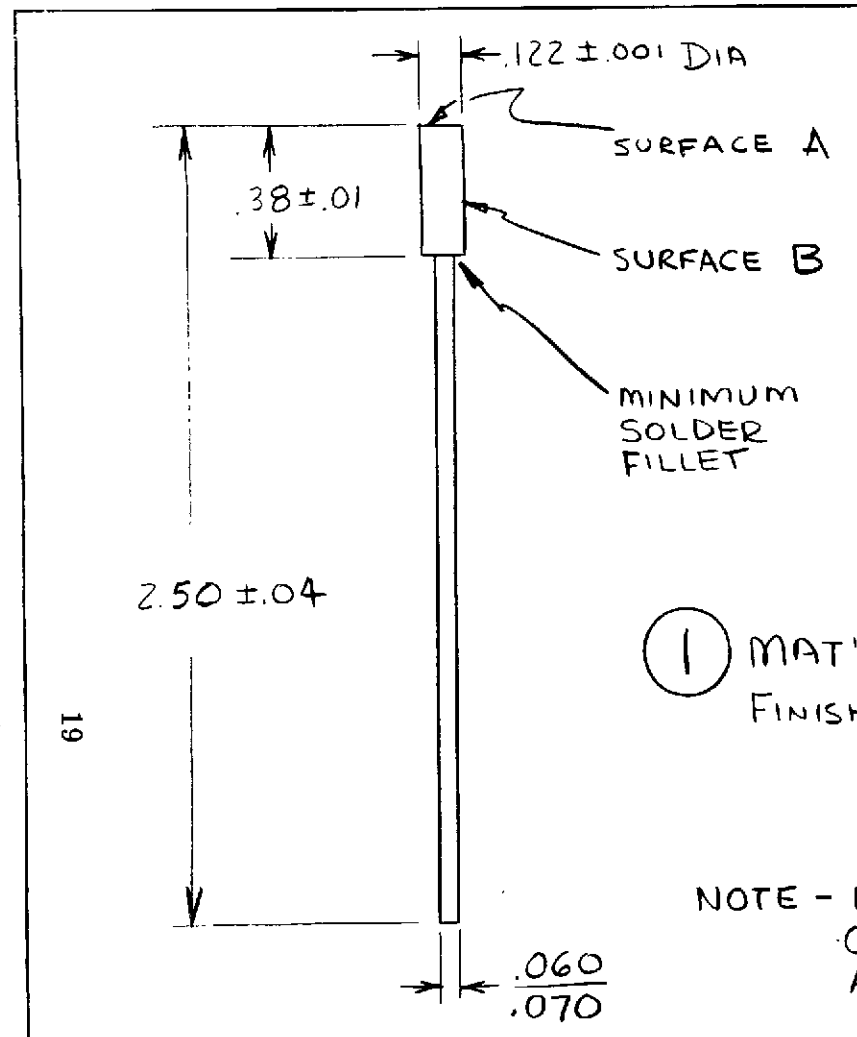
C1	15 μ f, 25V, tantalum
C3	25 μ f, 25V, tantalum
C4	15 μ f, 25V, tantalum
C5	26 pf, duramica
C8	0.001 μ f, 150V DC, disc
C9	0.001 μ f, 150V DC, disc
C10	33 pf, duramica
C11	91 pf, duramica
C12	2.7-20 pf, JFD Electronics, DVJ-300A
C13	500 μ f, 50V, tantalum
C14	1100 μ f, 50V, tantalum
CR-1	1N914 diode
CR-2	Rectifier diode, G. E. Co. A14A
CR-3	Rectifier diode, G. E. Co. A14A
CR-4	Rectifier diode, G. E. Co. A14A
CR-5	Rectifier diode, G. E. Co. A14A
L1	9 turns, #22 solid wire, 1/4" ID, natural set, carbonyl J slug cemented in center.
L2	Line choke, G. E. Co., MTD
L3	Choke, Millen 25 μ h
Q1	2N4996, T. I., rejects from noise figure selection process
Q2	2N4996, T. I., rejects from noise figure selection process
Q4	2N4996, T. I., rejects from noise figure selection process
Q5	2N4996, T. I., rejects from noise figure selection process
Q6	2N4996, T. I., rejects from noise figure selection process
Q7	2N3417, selected for V_{BE} breakdown of $9V \pm 0.5V$ and good zener characteristic
Q9	2N3417, selected for V_{BE} breakdown of $9V \pm 0.5V$ and good zener characteristic
R1	330 Ω , 1/2w, 10%
R2	620 Ω , 1/2w, 10%
R3	1.1K, 1/2w, 10%
R8	390K, 1/2w, 10%
R9	18K, 1/2w, 10%
R10	27K, 1/2w, 10%
R11	220 Ω , 1/2w, 10%
R12	22K, 1/2w, 10%
R13	56 Ω , 1/2w, 10%
R14	2.7K, 1/2w, 10%
R15	6.8K, 1/2w, 10%
R16	100 Ω , 1/2w, 10%

R17 4.7K, 1/2w, 10%
R18 1K, 1/2w, 10%
R19 33 Ω , 1/2w, 10%
R20 330 Ω , 2w, 10%
R21 620 Ω , 1/2w, 5%
R22 10 Ω , 2w, 10%
R23 8.2M, 1/2w, 10%
R24 220K, 1/2w, 10%

T2 Twisted Pairs #30 enameled wire, 4 turns on ferrite
toroid, type 25-6, from Amidon Associates, Hollywood, Calif.

The following drawings constitute the drafting package for the three converter types and the Tunnel Diode Amplifier.

The drawings as referred to in the parts lists are arranged in alphabetical order according to their original size and by serial number within each size.



REVISIONS		SIZE	REV
		CONT ON SHEET	SH NO.
SYM	DESCRIPTION	DATE	APPROVAL
A	.060 / .070 DIA WAS .060 ± .002 ADDED NOTE 2.50 LENGTH WAS 2.30	2/18	W. Jewett
B	ADDED MIN SOLDER NOTE	8/25	W. Jewett

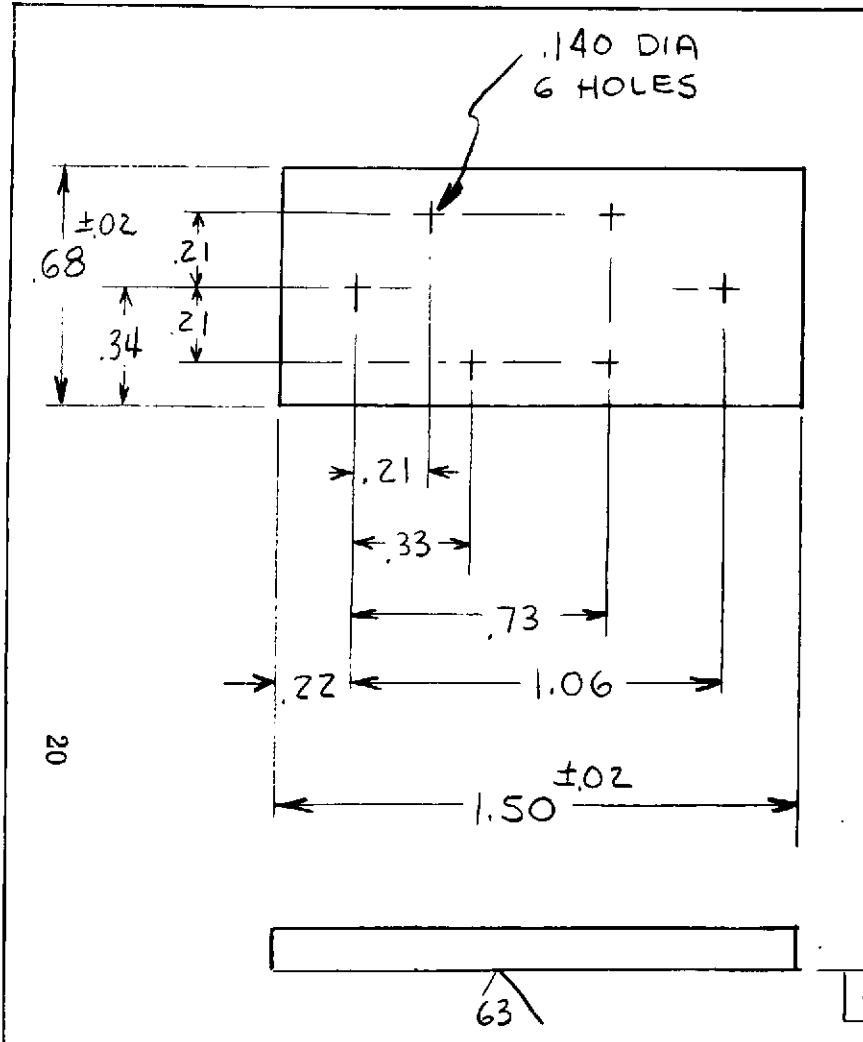
① MAT'L - COPPER
 FINISH - $\frac{.0001}{.0003}$ THK GOLD ON
 SURFACE A
 MAY PLATE ALL OVER.
 COAT SURFACE B WITH DUPONT
 1 COAT TEFLON ENAMEL $\frac{.0004}{.0003}$ THK
 NOTE - MAY BE FABRICATED OUT
 OF 2 PIECES AND SOLDERED
 AT JOINT

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
 TOLERANCES ON
 FRACTIONS DECIMALS ANGLES
 ± ± ±
 ALL SURFACES 63 ✓
 MATERIAL _____
 GOVT. OR COML. _____
 G-E _____

DRAWN *W. Jewett*
 DATE 2 Dec 1969
 APPD. *J. Husler*
 ISSUED 7/24/72
 APPROVED _____ DATE _____
 ENGR _____
 MFG _____
 MATL _____

DIODE
 CONTACT
 TV CONVERTER
 SCALE 2X WT CALC / ACTUAL

GENERAL ELECTRIC
 E-LAB
 DIV OR DEPT
 SYRACUSE
 LOCATION
 SIZE SK 56157-A91-48
 CONT ON SHEET SH NO. ✓
 CODE IDENT NO



REVISIONS		SIZE	REV
		CONT ON SHEET	SH NO. 160
SYM	DESCRIPTION	DATE	APPROVAL

① MAT'L - .12 THK ALUM ALLOY
 FINISH - IRRIDITE PER
 F65E-GP4-P1

- .002

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
 TOLERANCES ON
 FRACTIONS DECIMALS ANGLES
 ± .01 ± 125/ ✓
 ALL SURFACES

DRAWN *W. Jewett*
 DATE *13 Dec '69*
 APPD. *[Signature]*
 ISSUED *1/21/70*

COVER

TV CONVERTER

SCALE 2X

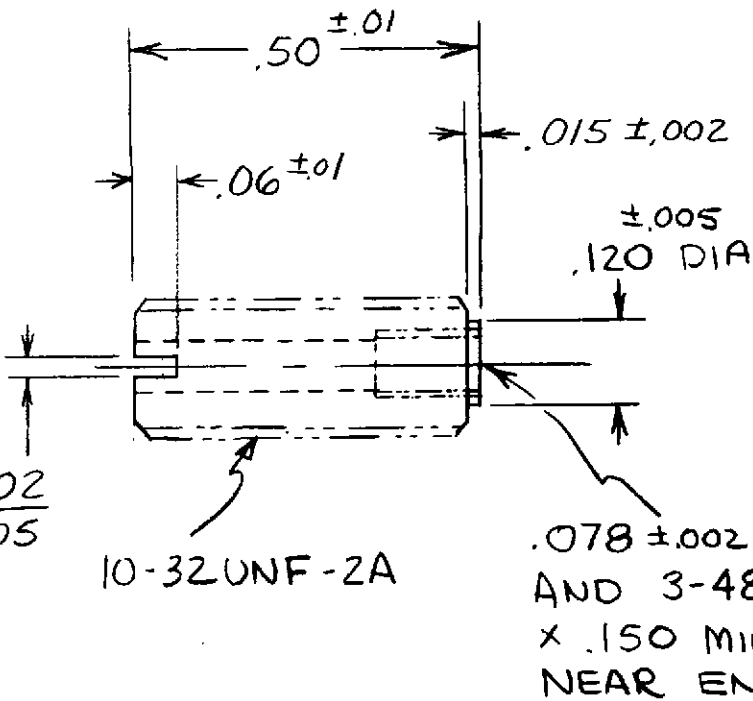
GENERAL ELECTRIC
 E-LAB
 DIV OR DEPT
 SYRACUSE
 LOCATION

SIZE
 SK 56157-A91-51

CONT ON SHEET SH NO.

MATERIAL
 GOVT. OR COML.
 G-E

APPROVED DATE
 ENGR
 MFG
 MATL



REVISIONS		SIZE	REV
CONT ON SHEET		SH NO.	163
SYM	DESCRIPTION	DATE	APPROVAL

① MAT'L - BRASS
 FINISH - SILVER PLATE
 PER F70H3

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
 TOLERANCES ON
 FRACTIONS DECIMALS ANGLES
 ± ± ±
 ALL SURFACES 125
 MATERIAL _____
 GOVT. OR COML. _____
 G-E _____

DRAWN *w. Jewett*
 DATE 2/17/70
 APPD. *J. Under*
 ISSUED 4/1/70
 APPROVED _____ DATE _____
 ENGR _____
 MFG _____
 MATL _____

DIODE
HOLDER

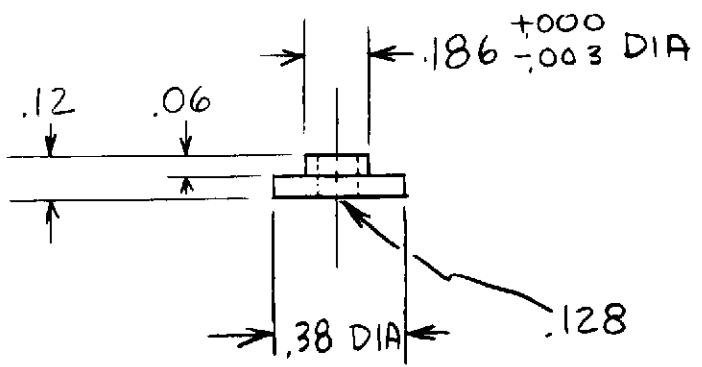
TV CONVERTER
 SCALE 4X WT ^{CALC} ACTUAL

GENERAL ELECTRIC
 E-LAB
 DIV OR DEPT
 SYRACUSE
 LOCATION

SIZE SK 56157-A91-68
 CONT ON SHEET SH NO.

PRINTS TO

REVISIONS		SIZE	REV
		CONT ON SHEET	SH NO. 164
SYM	DESCRIPTION	DATE	APPROVAL

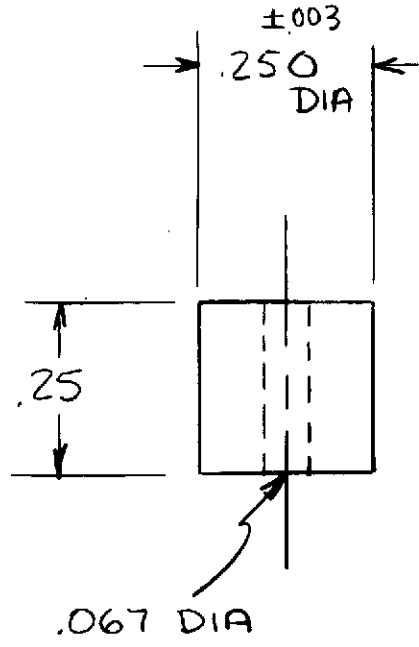


① MATIL - ALUM ALLOY
 FINISH - IRIDITE PER F65E-GP4-PI

PRINTS TO

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES ± .01 ± ALL SURFACES 64	DRAWN <i>w. Jant</i>	<h1>SPACER</h1>	GENERAL ELECTRIC		
	DATE <i>8 May 1970</i>		E-LAB		
APPD <i>[Signature]</i>	DIV OR DEPT		SYRACUSE, N.Y.		
ISSUED <i>2/24/70</i>	LOCATION		LOCATION		
MATERIAL	APPROVED	DATE	SIZE	SK 56157-A91-86	
GOVT. OR COML.	ENGR		CONT ON SHEET		
G-E	MFG		TV - CONVERTER		SCALE 2X
	MATL		WT CALC ACTUAL		

REVISIONS		SIZE	REV
CONT ON SHEET		SH NO. 165	
SYM	DESCRIPTION	DATE	APPROVAL



① MAT'L - TEFLON

PRINTS TO

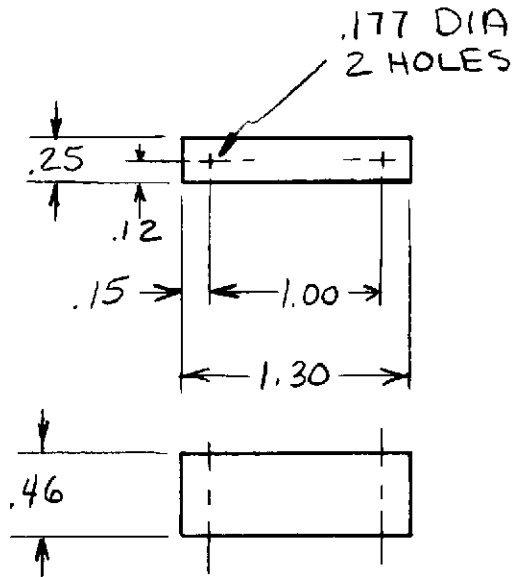
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ±.02 ±
ALL SURFACES ✓
MATERIAL
GOVT. OR COML.
G-E

DRAWN *W. Jewett*
DATE
APPD *J. Hasler*
ISSUED *2/24/70*
APPROVED
DATE
ENGR
MFG
MATL

WASHER
TV-CONVERTER
SCALE
WT CALC ACTUAL

GENERAL ELECTRIC
E-LAB
DIV OR DEPT
SYRACUSE
LOCATION
SIZE
SK 56157-A91-87
CONT ON SHEET SH NO.

REVISIONS		SIZE	REV
		CONT ON SHEET	SH NO. 166
SYM	DESCRIPTION	DATE	APPROVAL



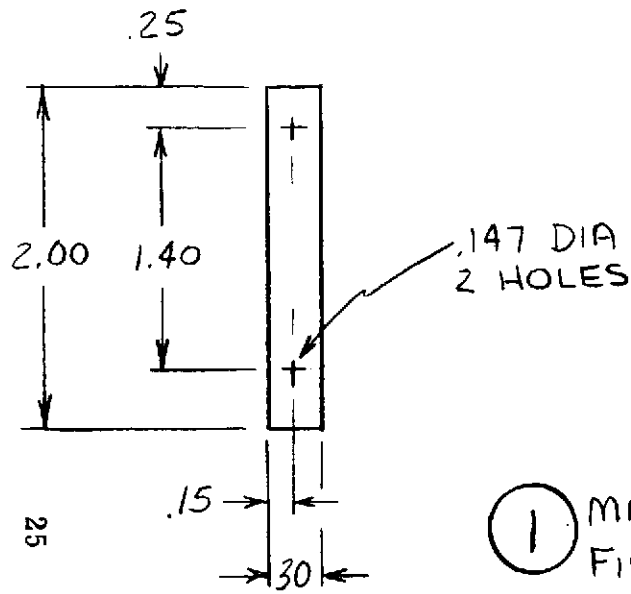
24

① MAT'L - ALUM ALLOY
FINISH - IRLDITE PER F65E-GP4-PI

PRINTS TO

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES ± .03 ±	DRAWN <i>W. Jewett</i>	SPACER BLOCK (2.0 GHz FM ANTENNA UNIT)	GENERAL ELECTRIC E-LAB		
	DATE <i>11 May 1970</i>		DIV OR DEPT SYRACUSE		
APPD _____	ISSUED _____		LOCATION		
APPROVED _____	DATE _____		SIZE SK	56157-A91-90	
MATERIAL	ENGR <i>J. Nesler</i> <i>4/7/70</i>	SCALE 1X	WT <small>CALC</small> ACTUAL	CONT ON SHEET	SH NO.
GOVT. OR COML.	MFG _____				
G-E	MATL _____				

REVISIONS		SIZE	REV
CONT ON SHEET		SH NO.	167
SYM	DESCRIPTION	DATE	APPROVAL



① MAT'L - .12 THK ALUM ALLOY
 FINISH - IRIDITE PER F65E-GP4-P1

PRINTS TO

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
 TOLERANCES ON
 FRACTIONS DECIMALS ANGLES
 ± ±.02 ±
 ALL SURFACES 125/

DRAWN *W. Jewett*
 DATE *15 Aug 1970*
 APPD _____
 ISSUED _____
 APPROVED _____ DATE _____
 ENGR _____
 MFG _____
 MATL _____

SPACER
 (2.25 GHZ AM ANTENNA UNIT)

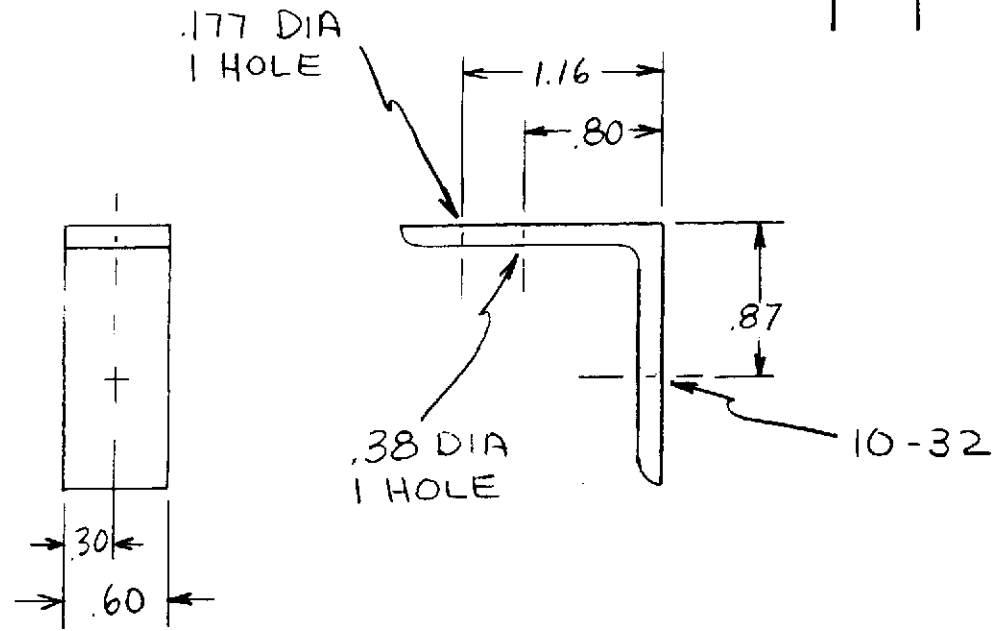
SCALE 1X WT CALC / ACTUAL

GENERAL ELECTRIC
 E-LAB
 DIV OR DEPT
 SYRACUSE
 LOCATION

SIZE
 SK 56157-A91-106

CONT ON SHEET SH NO.

REVISIONS		SIZE	REV
CONT ON SHEET		SH NO.	168
SYM	DESCRIPTION	DATE	APPROVAL



① MAT'L - 1 1/2 x 1 1/2 x 1/8 STEEL ANGLE
FINISH - NONE

26

PRINTS TO

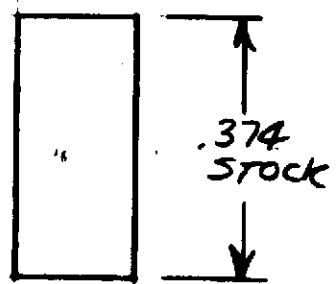
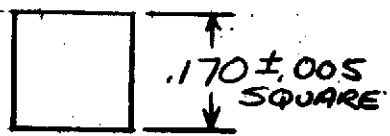
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES ± .02 ±	DRAWN <i>W. Jewett</i>	TUNNING FIXTURE, CAVITY PROPE (120 GHZ FM ANTENNA UNIT)	GENERAL ELECTRIC E-LAB DIV OR DEPT SYRACUSE LOCATION		
	DATE <i>8/24/70</i>		SIZE SK 56157-A91-109		
APPD <i>H. S. L.</i>	SCALE 1X				WT <small>CALC</small> ACTUAL
ALL SURFACES 125	ISSUED <i>7/21/70</i>				
MATERIAL	APPROVED	DATE			
GOVT. OR COML.	ENGR				
G-E	MFG				
	MATL				

SIZE
A

SHEET

REV

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



① MAKE FROM MAGNETIC
PLATE STOCK FROM
INDIANA GENERAL CORP
OR EQUIV.

FN 901-F (2-66) PRINTED IN U.S.A.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
TOLERANCES ON:

FRACTIONS	DECIMALS	ANGLES
±	±	±

ALL SURFACES 125 ✓
MATL-

SIGNATURES		DAY	MO	YR
DRAWN	<i>W. Jewett</i>	3	8	71
CHECKED				
ISSUED				
ENGRG				
MFG				
MATLS				

GENERAL ELECTRIC
E-LAB DEPT LOC SYRACUSE

CIRCULATOR MAGNETS

SIZE	CODE IDENT NO.
A	13688 SK56157-A148-14

SCALE 4X SHEET

27

D'ST TO

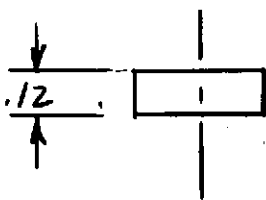
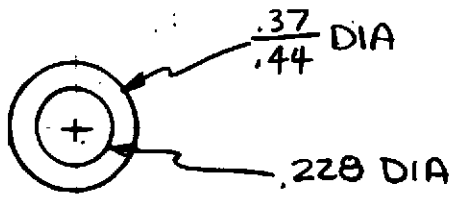
SIZE
A

SHEET

REV

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED



① MAT'L - ALUM ALLOY
 FINISH - CLEAR ANODIZE PER F65B2B

FN 903-F (4-66) PRINTED IN U.S.A.

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES.
 TOLERANCES ON:

FRACTIONS	DECIMALS	ANGLES
±	±.02 ±	125 ✓

ALL SURFACES
 MATL-

SIGNATURES	DAY	MO	YR
DRAWN <i>W. J. ...</i>	27	9	71
CHECKED			
ISSUED			
ENGRG			
MFG			
MATLS			

GENERAL ELECTRIC
 E-LAB DEPT LOC SYRACUSE

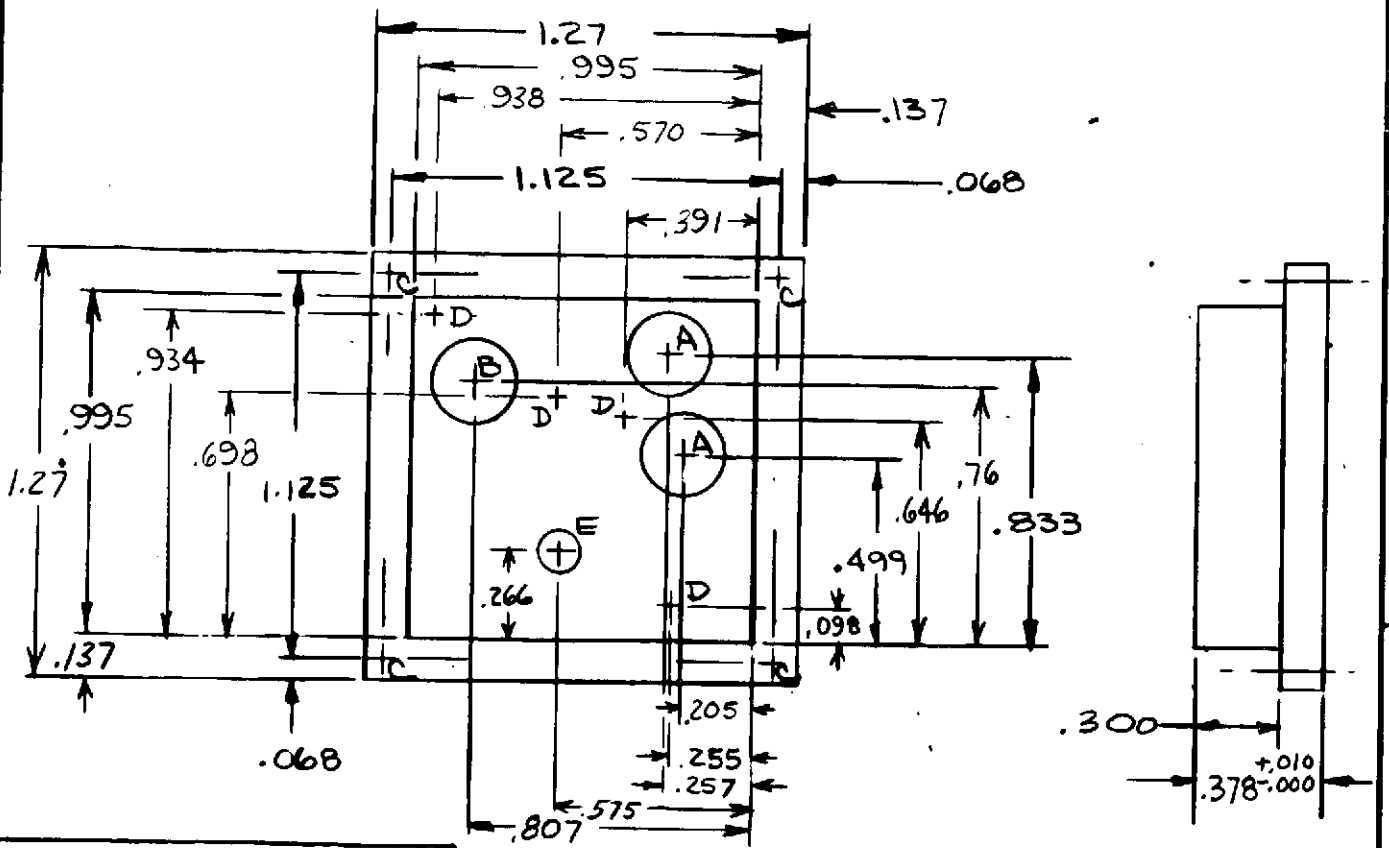
SPACER

28

SIZE A	CODE IDENT NO. 13688	SK56157-A148-17
SCALE 2x		SHEET



REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	ADDED 2 D HOLES	5 OCT 71	w. J. [Signature]
B	E HOLE WAS .125 DIA X .010 DEEP C-BORE D HOLES LOCATION: .391 WAS .386, & .255 WAS .250. E HOLE LOCATION: .975 WAS .967	12 OCT 71	w. J. [Signature]



⓪ FINISH - CLEAR ANODIZE PER F65B2B

LTR	DISCRIPTION	QTY
A	.250 DIA THRU	2
B	.287 ^{+0.010} _{-.000} DIA THRU	1
C	.094 DIA	4
D	0-80 X .10 MIN DEEP	4
E	.094 DIA X .010 DEEP SPOTFACE	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:

FRACTIONS DECIMALS ANGLES
 $\pm .XX \pm .01 \pm$
 $.XXX .005 \pm$

ALL SURFACES ✓

MATL - ALUMINUM

SIGNATURES		DAY	MO	YR
DRAWN	[Signature]	20	9	71
CHECKED				
ISSUED				
ENGRG				
MFG				
MATLS				

GENERAL ELECTRIC
 E-LAB DEPT LOC SYRACUSE

CAP

SIZE	CODE IDENT NO.	
A	13688	SK56157-A 148-18

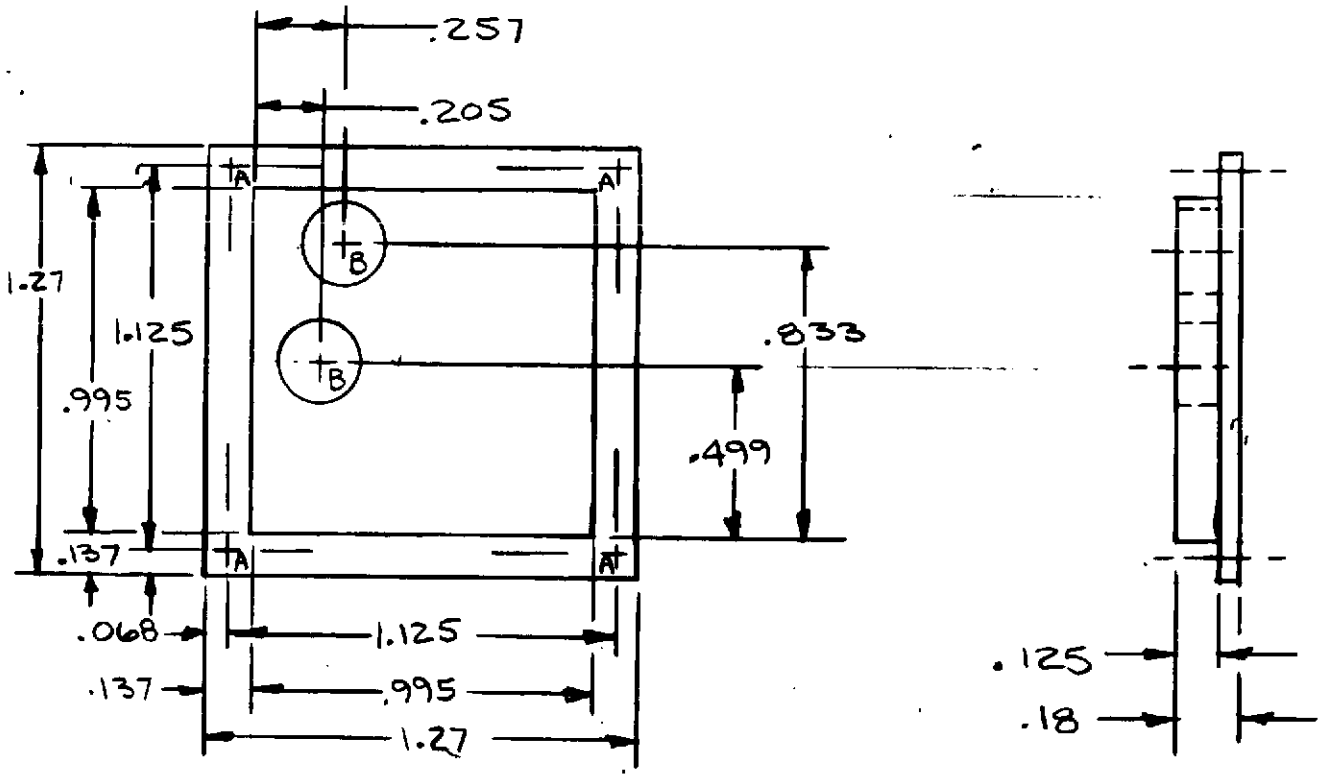
SCALE 2X SHEET 1 OF 1

SIZE
A

SHEET

RF.

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



HOLE CHART		
LTR	DISC	QTY
A	.094 DIA	4
B	.250 DIA X .125 DP.	2

① FIN. CLEAR ANODIZE

FN 901-F (10-69) PRINTED IN U.S.A.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:

FRACTIONS DECIMALS ANGLES
 $\pm .XX \pm .01$
 $\pm .XXX \pm .005$

ALL SURFACES ✓

MATL-
ALUM

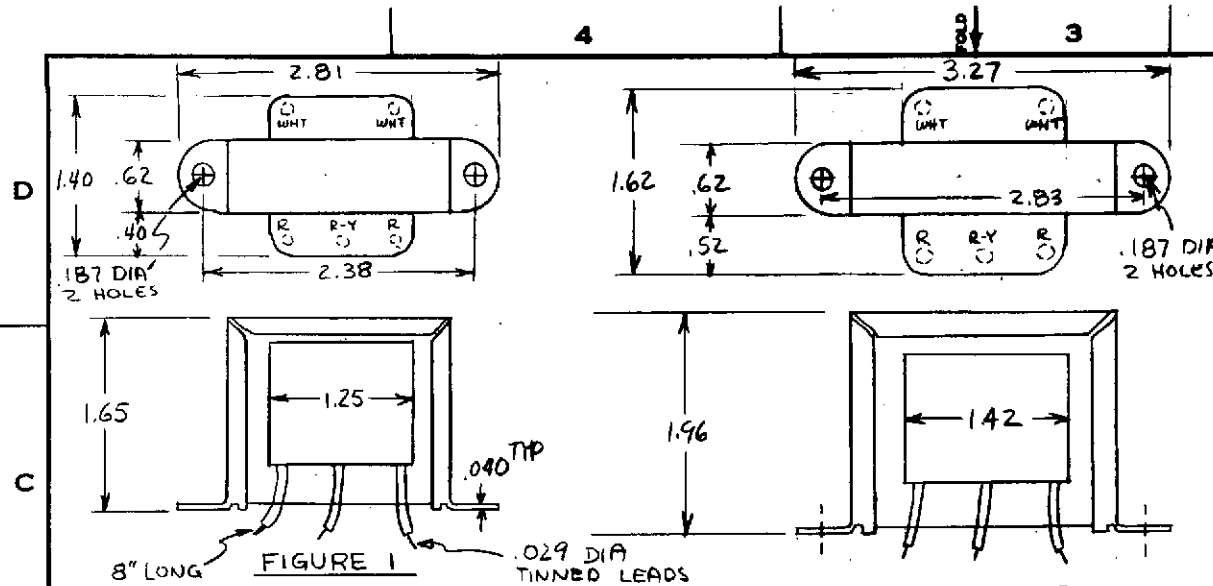
SIGNATURES	DAY	MO	YR
DRAWN <i>[Signature]</i>	28	7	71
CHECKED			
ISSUED			
ENGRG			
MFG			
MATLS			

GENERAL ELECTRIC
 ELAB DEPT LOC SYRACUSE

COVER

30	SIZE A	CODE IDENT NO. 13688	SK56157-A/48-19
	SCALE 2X		SHEET 1 OF 1

31ST FO



REVISIONS		DATE	APPROVED
ZONE	LTR	DESCRIPTION	
A		ADDED FIGURE 2	6 APR 70 <i>W. Jewett</i>

389

FIGURE 2

PURCHASE FROM
ELECTRONIC COMPONENTS CO.
ADDISON, ILL
OR ANOTHER APPROVED VENDOR

	PART NUMBER		
	1	2	3
CATALOG NO.	X44-5315	X44-5315B	
OUTLINE FIGURE	1	2	AS REQUIRED
PRIMARY INPUT	120V @ 60CPS	120V @ 60CPS	120V @ 60CPS
URNS RATIO (PRIMARY TO FULL SECONDARY)	AS IS	1.54 : 1	1.9 : 1
EXCITATION CURRENT (MARMS)	AS IS	10.6	10.6
PRIMARY RESISTANCE (OHMS)	AS IS	≤ 57	≤ 92.5
SECONDARY RESISTANCE (OHMS)	AS IS	≤ 28	≤ 28
RECTIFIED LOAD CURRENT (MA DC)	AS IS	280.0	480.0
SECONDARY CENTER TAPPED	YES	YES	YES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: FRACTIONS DECIMALS ANGLES ± ± ± ALL SURFACES ✓ MATL.	SIGNATURES		DAY	MO	YR
	DRAWN <i>W. Jewett</i>		6	2	70
	CHECKED				
	ISSUED				
	ENGRG				
<p>GENERAL ELECTRIC E-LAB DEPT LOC SYRACUSE</p> <p>TRANSFORMER</p> <p>TV CONVERTER</p> <p>SIZE CODE IDENT NO. B 13688 SK56157-891-63</p> <p>SCALE 1X SHEET</p>					

FN 902-F (4-69) PRINTED IN U.S.A.

POST TO

4

FOLD

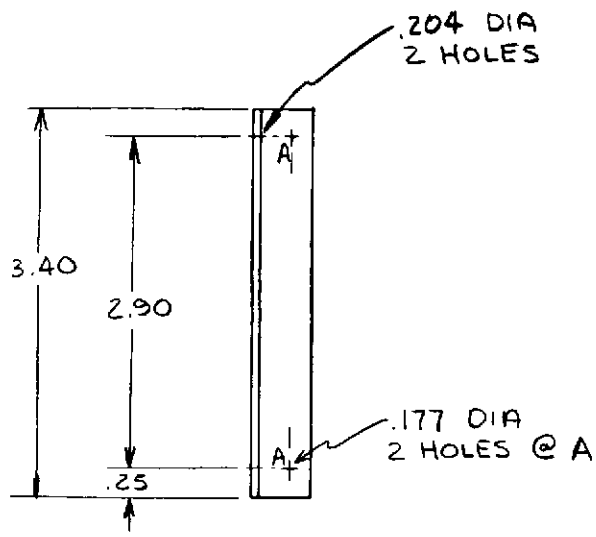
3

2

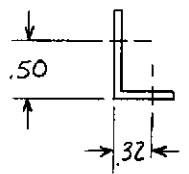
SIZE B SHEET REV

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	ADDED FINISH	5 MAY 70	W. J. J...

39/



① MAT'L - ALUM ANGLE $\frac{3}{4} \times \frac{1}{2} \times .06$
 FINISH - MATTE BLACK ANODIZE PER F6SB6B



FN 902F (4-69) PRINTED IN U.S.A.

A

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: FRACTIONS DECIMALS ANGLES ± .02 ±	SIGNATURES		DAY	MO	YR
	DRAWN W. J. J...		16	4	70
	CHECKED W. J. J...		5	5	70
	ISSUED				
	ENGRG				
ALL SURFACES 125/	MFG				
MATL-	MATLS				

GENERAL ELECTRIC
E-LAB DEPT LOC SYRACUSE

ANGLE

SIZE B	CODE IDENT NO. 13688	SK56157-891-81
SCALE 1 X	SHEET	

5

4

FOLD

3

2

DIST TO

✓

4

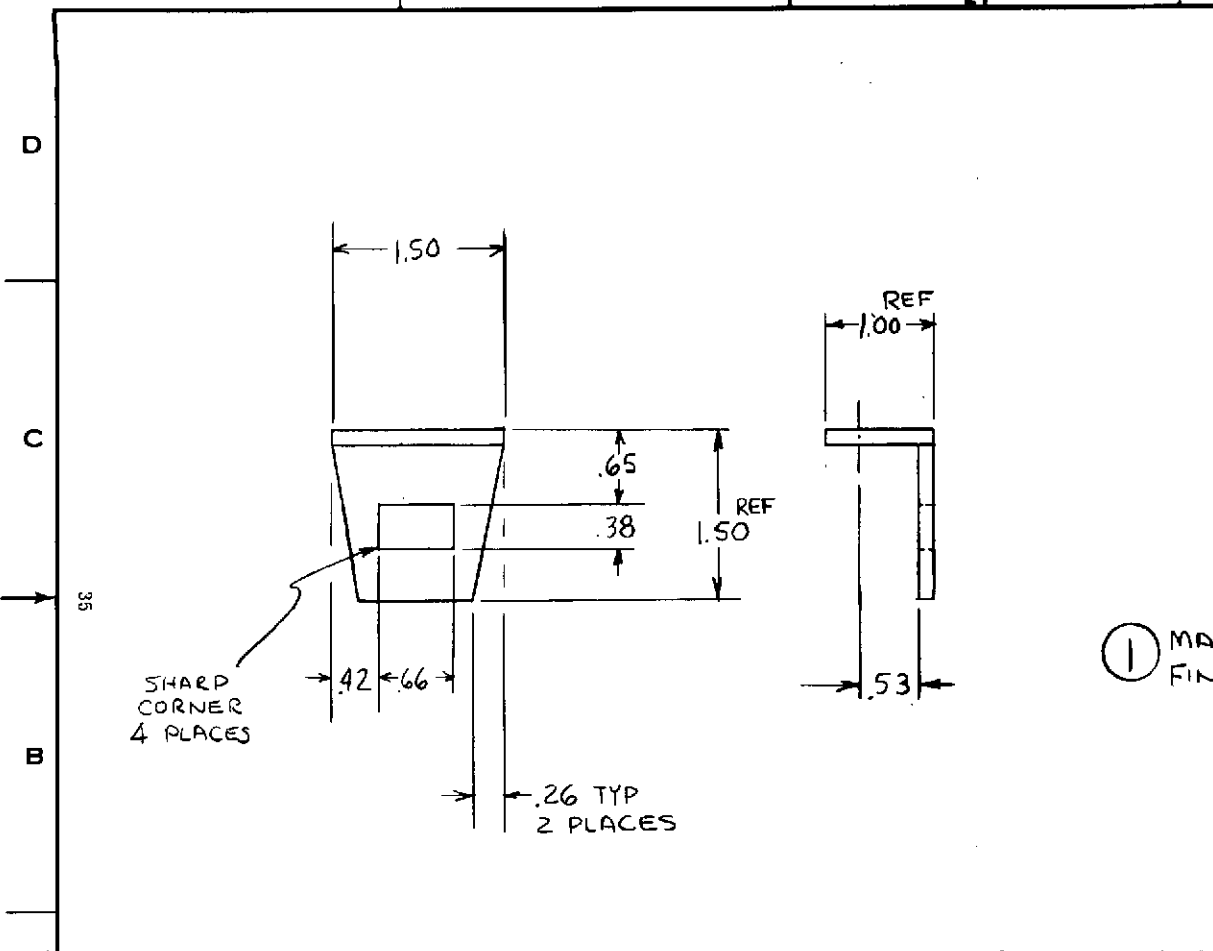
3

2

SIZE B SHEET REV

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	WAS BENT UP, .53 WAS .51, 1.50 WAS 1.30, DELETED, 2 HOLES	4 MAY 1970	<i>W. Jewett</i>
	B	ADDED 2 CHAMFERS	14 MAY 1970	<i>W. Jewett</i>

392



① MAT'L - ALUM ALLOY ANGLE 1.00 x 1.50 x .12
 FINISH - NONE

FN 902-F (10-68) PRINTED IN U.S.A.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: FRACTIONS DECIMALS ANGLES ± ± .02 ± ALL SURFACES 125/ MATL:	SIGNATURES		DAY	MO	YR	GENERAL ELECTRIC E-LAB DEPT LOC SYRACUSE CHEATER CORD MTG. BRACKET	
	DRAWN <i>W. Jewett</i>		17	4	70		
	CHECKED <i>W. Jewett</i>		5	5	70		
	ISSUED						
	ENDRG					SIZE	CODE IDENT NO.
	MFG					B	13688 SK56157-B91-82
	MATLS					SCALE	1 X SHEET

5

4

3

2

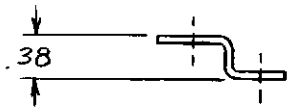
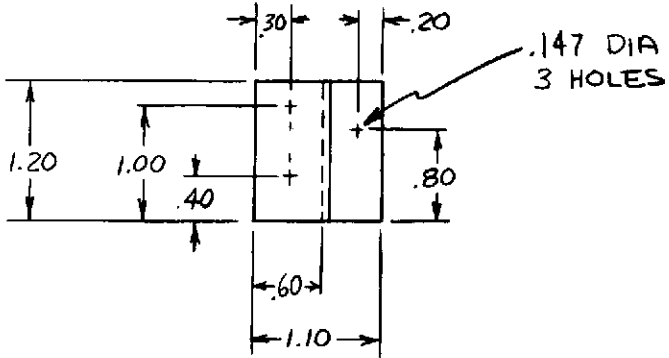
FOLD

DIST TO

V

REVISIONS			
ZONE	LTR	DESCRIPTION	DATE

395



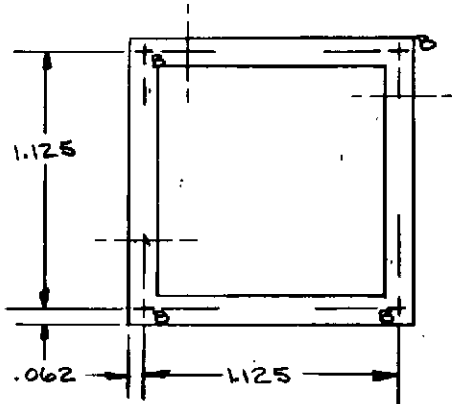
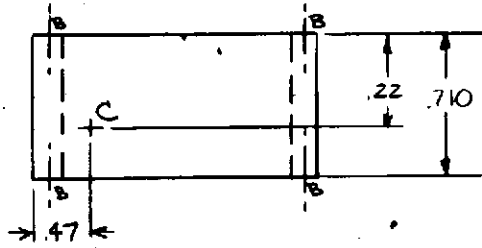
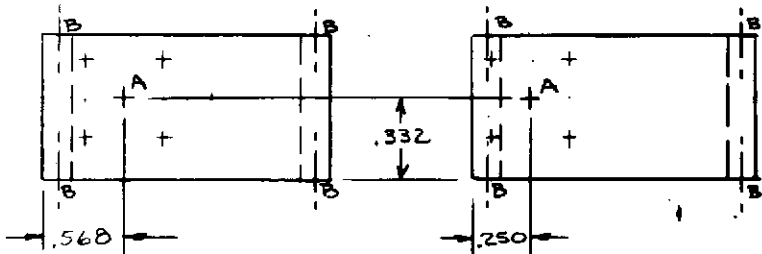
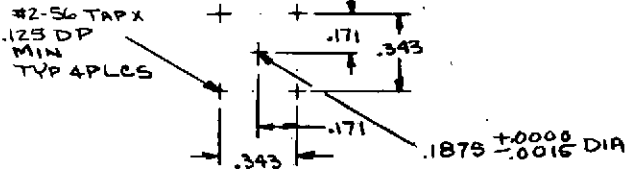
① MAT'L - .06 THK ALUM ALLOY
 BEND ON .06R
 FINISH - MATTE BLACK ANODIZE
 HARD COAT.
 (FOR INSULATION PURPOSES)

FN 902 F (2-70) PRINTED IN U.S.A.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: FRACTIONS DECIMALS ANGLES ± ±.02 ± ALL SURFACES 125/ MAT'L	SIGNATURES		DAY	MO	YR	GENERAL ELECTRIC E-LAB DEPT LOC SYRACUSE HEAT SINK BRACKET (12.0 GHZ FM ANTENNA UNIT) SIZE CODE IDENT NO. B 13688 SK56157-B91-116
	DRAWN <i>W. J. ...</i>		12	9	70	
	CHECKED <i>[Signature]</i>					
	ISSUED					
	ENGRG <i>[Signature]</i>		15	9	70	
	MFG					SCALE
	SHEET					

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

DRILL PLAN A
TYP 2 PLCS



HOLE CHART		
LTR	DISC.	QTY
A	DRILL PLAN A	2
B	#2-56 X .125 DP	8
C	12-28 TAP THRU	1

① FIN. CLEAR ANODIZE

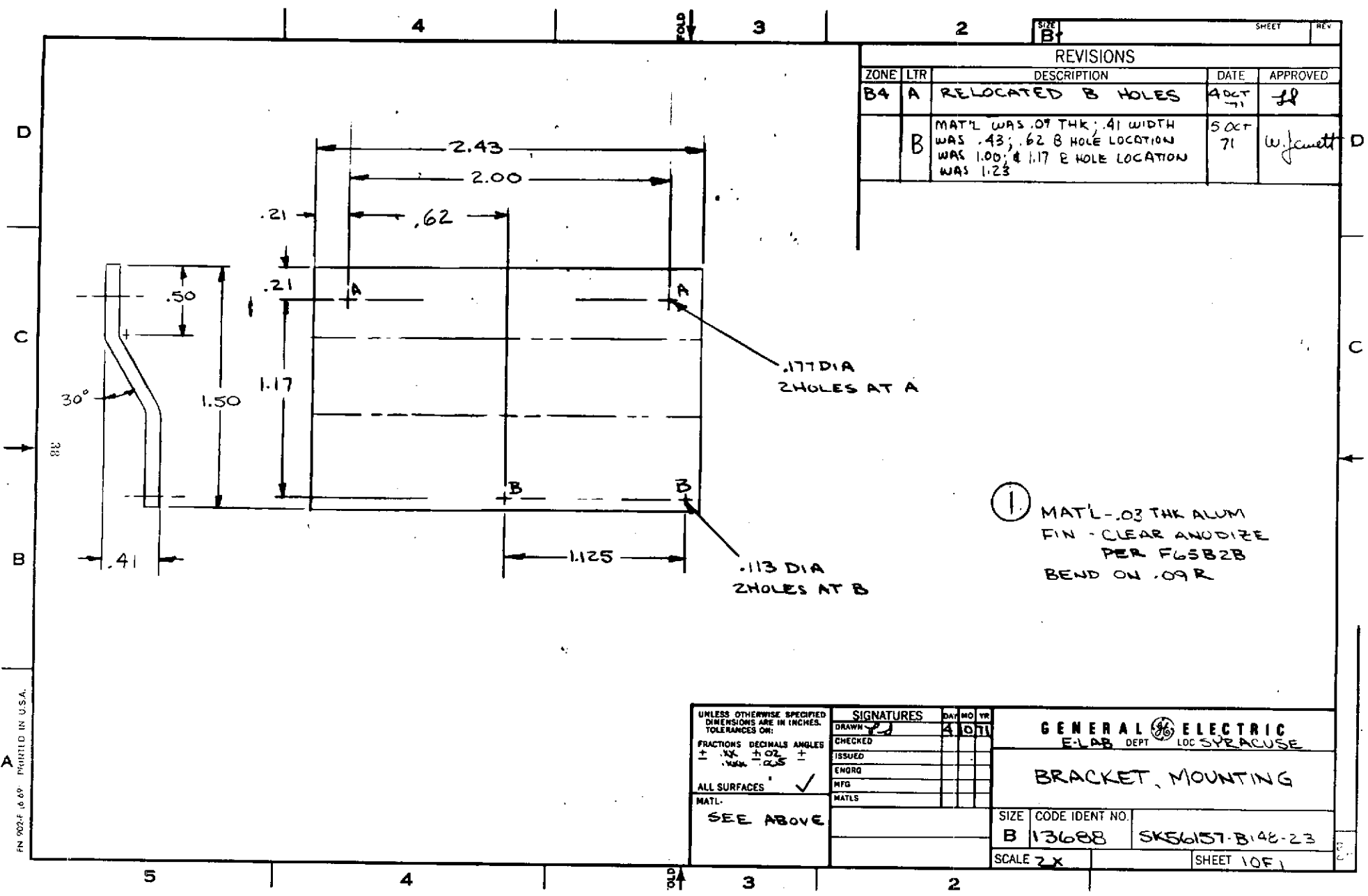
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:
 FRACTIONS DECIMALS ANGLES
 $\pm .XX \pm .01 \pm$
 $.XXX .005$
 ALL SURFACES
 MATL: 1.250
 X.125 WALL
 THK SQUARE
 ALUM TUBING

SIGNATURES				DAY	MO	YR
DRAWN				28	9	71
CHECKED						
ISSUED						
ENGRG						
MFG						
MATLS						

GENERAL ELECTRIC
 E-LAB DEPT LOC SYRACUSE

HOUSING

SIZE	CODE IDENT NO.
B	13688 SK5657-B148-21
SCALE 2X	SHEET 10 F1



SIZE B SHEET REV

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
B4	A	RELOCATED B HOLES	4 OCT 71	JL
	B	MAT'L WAS .09 THK; .41 WIDTH WAS .43; .62 B HOLE LOCATION WAS 1.00; & 1.17 B HOLE LOCATION WAS 1.23	5 OCT 71	W. J. Bennett

① MAT'L -.03 THK ALUM FIN - CLEAR ANODIZE PER F65B2B BEND ON .09 R

FN 9024E (6-69) PRINTED IN U.S.A.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:		SIGNATURES		DATE	MO	YR
FRACTIONS	DECIMALS	ANGLES	DRAWN	4	10	71
± .XX	± .02	±	CHECKED			
± .XXX	± .005		ISSUED			
			ENGR			
ALL SURFACES		✓	MFG			
MATL			MATLS			
SEE ABOVE						

GENERAL ELECTRIC
E-LAB DEPT LOC SYRACUSE

BRACKET, MOUNTING

SIZE CODE IDENT NO.
B 13688 SK56157-B148-23

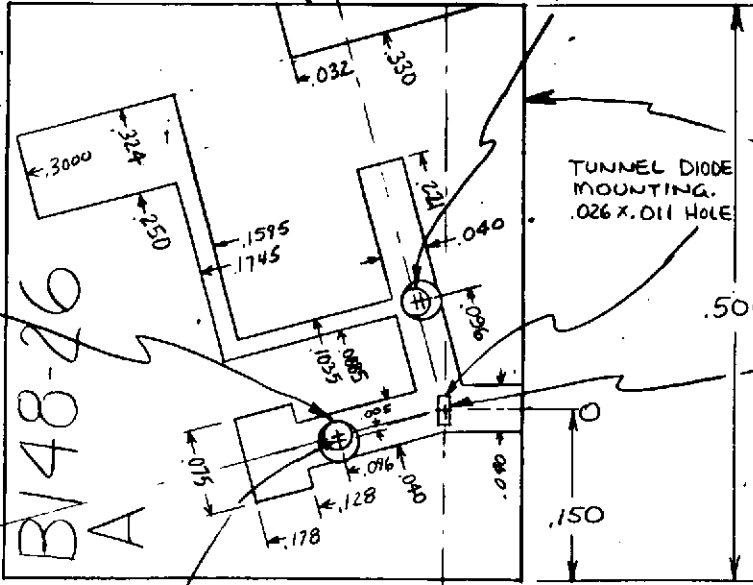
SCALE 2 X SHEET 1 OF 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	ADDED FOLD OVER GROUND	23 NOV 1971	W Jewett
	B	.035 DIA HOLES WERE CONCENTRIC WITH .025 HOLE	1 DEC 1971	W Jewett

RESISTOR
 SPECIAL BUILT BY
 GE SEMICONDUCTOR
 PRODUCTS DEPT.
 50Ω SILICON CHIP
 RESISTOR.
 (SEE ASSY DETAIL)

(R5)

FOLD OVER
 GROUND



(R6) RESISTOR
 SAME AS R5

TUNNEL DIODE
 MOUNTING.
 .026 X .011 HOLE

(1) **SUBSTRATE**
 MATIL-GLASS K-650 .025 THK

(2) **TUNNEL DIODE**
 SPECIAL BUILT BY
 GE SEMICONDUCTOR PRODUCTS DEPT
 WITH THE FOLLOWING SPECS.
 $I_p = 2.0 \pm .5 \text{ MA}$
 $C_d = 0.2 \pm .02 \text{ PF}$
 $R_f = -70 \pm 10 \Omega$
 $R_s = 6 \pm 2 \Omega$

(G1)

FASTEN IN PLACE
 WITH LOW LOSS EPOXY
 AFTER WELDING



CROSS SECT.
 RESISTOR MTG.

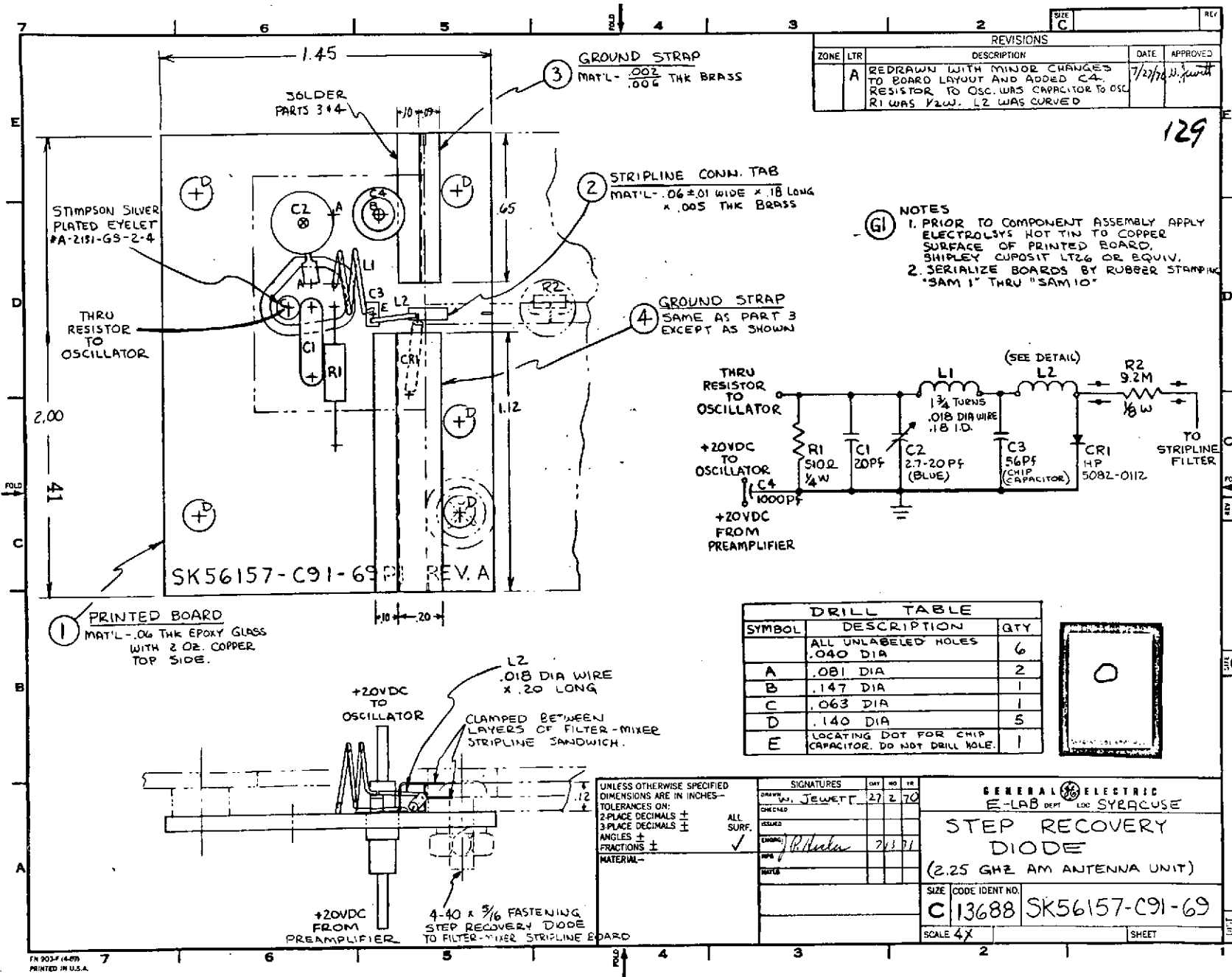
TWO .002 DIA
 GOLD WIRES
 WELDED AS
 SHOWN.
 TYP FOR R4 & R5

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: FRACTIONS DECIMALS ANGLES ± ± ± ALL SURFACES ✓ MATL.	SIGNATURES		DAY	MO	YR
	DRAWN <i>W Jewett</i>		26	10	71
	CHECKED				
	ISSUED				
	ENGRG				
	MFG				
	MATLS				

GENERAL ELECTRIC
 E-LAB DEPT. LOC. 57A-2-E

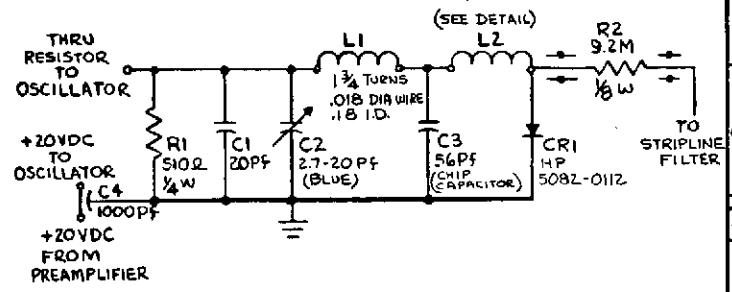
**TUNNEL DIODE
 SUBSTRATE**

SIZE	CODE IDENT NO.	
B	13688	SK56157-B148
SCALE (OX)	SHEET	



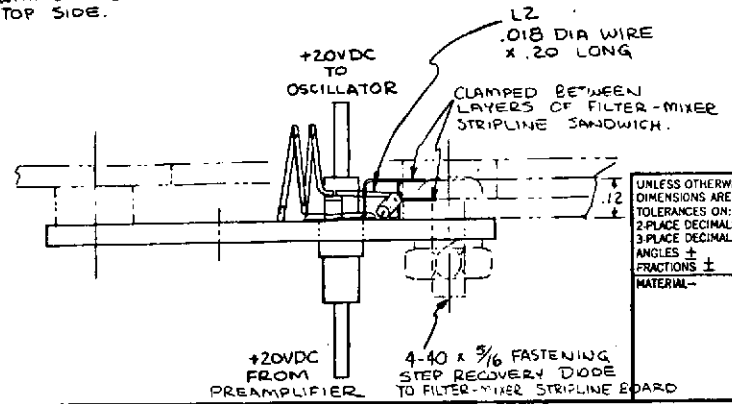
REVISIONS		DATE	APPROVED
ZONE	LTR	DESCRIPTION	
A		REDRAWN WITH MINOR CHANGES TO BOARD LAYOUT AND ADDED C4. RESISTOR TO OSC. WAS CAPACITOR TO OSC. R1 WAS 1/2W. L2 WAS CURVED	7/27/70 J. Jewett

- NOTES**
1. PRIOR TO COMPONENT ASSEMBLY APPLY ELECTROLYSIS HOT TIN TO COPPER SURFACE OF PRINTED BOARD. STRIPLEY COMPOSIT LT26 OR EQUIV.
 2. SERIALIZE BOARDS BY RUBBER STAMPING "SAM 1" THRU "SAM 10"



① PRINTED BOARD
 MAT'L - .06 THK EPOXY GLASS WITH 2 OZ. COPPER TOP SIDE.

SYMBOL	DESCRIPTION	QTY
	ALL UNLABELED HOLES .040 DIA	6
A	.081 DIA	2
B	.147 DIA	1
C	.063 DIA	1
D	.140 DIA	5
E	LOCATING DOT FOR CHIP CAPACITOR. DO NOT DRILL HOLE.	1



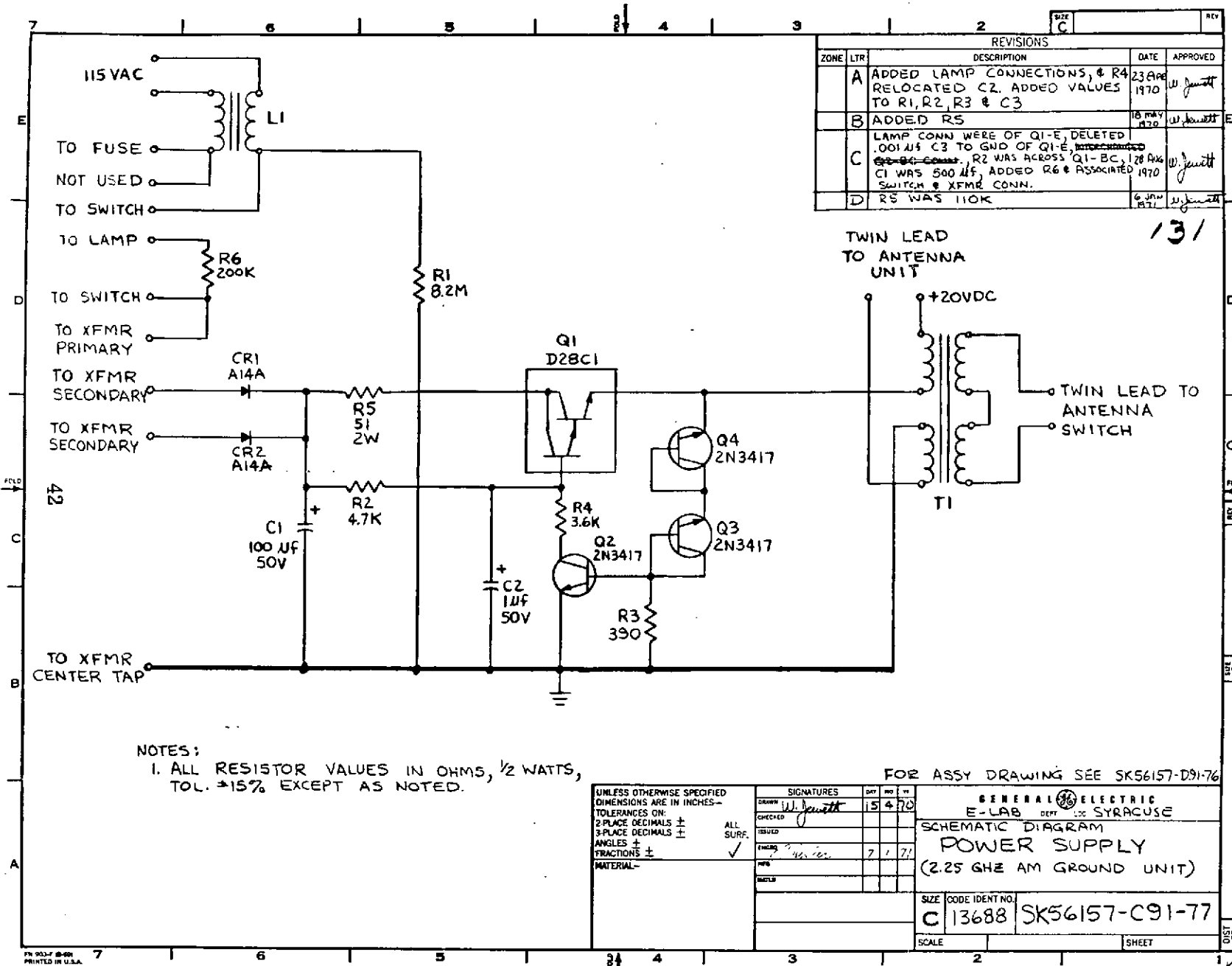
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES—
 TOLERANCES ON:
 2-PLACE DECIMALS ±
 3-PLACE DECIMALS ±
 ANGLES ±
 FRACTIONS ±
 MATERIAL—

SIGNATURES		DAY	MO	YR
DESIGN	J. Jewett	27	2	70
CHECKED				
ISSUED				
ENGR	R. H. ...	7	1	71
DATE				

GENERAL ELECTRIC
 E-LAB DEPT LOC SYRACUSE
STEP RECOVERY DIODE
 (2.25 GHz AM ANTENNA UNIT)

SIZE CODE IDENT NO.
C 13688 SK56157-C91-69

SCALE 4X SHEET



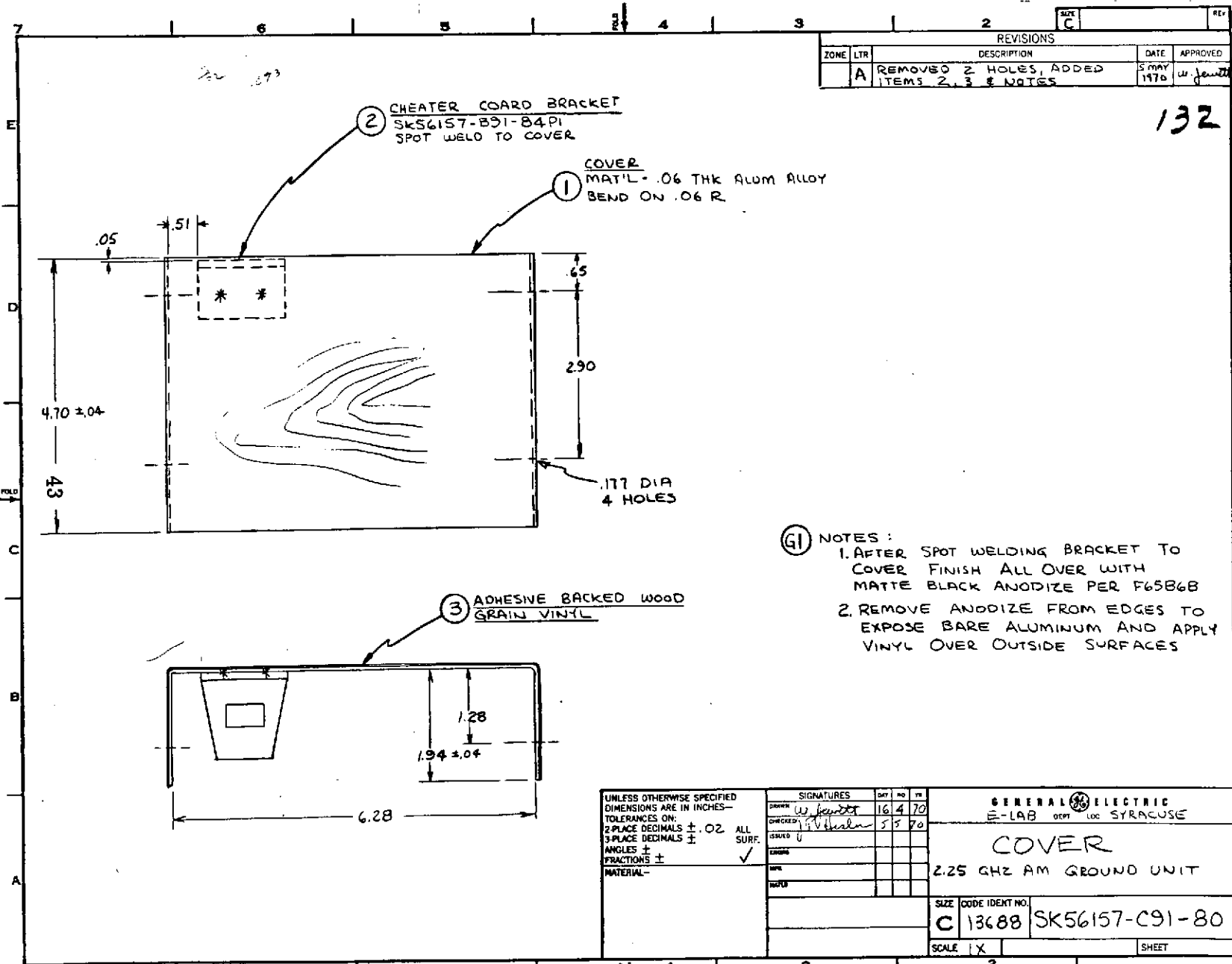
ZONE		DESCRIPTION	DATE	APPROVED
A		ADDED LAMP CONNECTIONS, & R4 RELOCATED C2. ADDED VALUES TO R1, R2, R3 & C3	23 APR 1970	W. Jewett
B		ADDED R5	18 MAY 1970	W. Jewett
C		LAMP CONN WERE OF Q1-E, DELETED .001 uF C3 TO GND OF Q1-E, RELOCATED R2 WAS ACROSS Q1-BC, 128 R66 C1 WAS 500 uF, ADDED R6 & ASSOCIATED SWITCH & XFMR CONN.	178 APR 1970	W. Jewett
D		R5 WAS 110K	6 JAN 1971	W. Jewett

131

NOTES:
 1. ALL RESISTOR VALUES IN OHMS, 1/2 WATTS, TOL. ±15% EXCEPT AS NOTED.

FOR ASSY DRAWING SEE SK56157-D91-76

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES— TOLERANCES ON: 2-PLACE DECIMALS ± 3-PLACE DECIMALS ± ANGLES ± FRACTIONS ± MATERIAL—	ALL SURF. ✓	SIGNATURES	DATE	REV.	BY
		DRAWN	15	4	70
		CHECKED			
		ISSUED			
GENERAL ELECTRIC E-LAB DEPT. 32 SYRACUSE					
SCHEMATIC DIAGRAM POWER SUPPLY (2.25 GHz AM GROUND UNIT)					
SIZE		CODE IDENT NO.			
C		13688 SK56157-C91-77			
SCALE		SHEET			



REV. NO.		REV. C	REV.
REVISIONS			
ZONE	LTR	DESCRIPTION	DATE APPROVED
A		REMOVED 2 HOLES, ADDED ITEMS 2, 3 & NOTES	5 MAY 1970 <i>W. Jewett</i>

132

- (G1) NOTES:
- AFTER SPOT WELDING BRACKET TO COVER FINISH ALL OVER WITH MATTE BLACK ANODIZE PER F65B6B
 - REMOVE ANODIZE FROM EDGES TO EXPOSE BARE ALUMINUM AND APPLY VINYL OVER OUTSIDE SURFACES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES—
 TOLERANCES ON:
 2-PLACE DECIMALS ± .02 ALL SURF.
 3-PLACE DECIMALS ±
 ANGLES ±
 FRACTIONS ±
 MATERIAL—

SIGNATURES		DATE	NO.	REV.
DRAWN	<i>W. Jewett</i>	16	4	70
CHECKED	<i>V. V. ...</i>	5	5	70
DESIGNED				
MATERIAL				

GENERAL ELECTRIC
 E-LAB DEPT LOC SYRACUSE

COVER

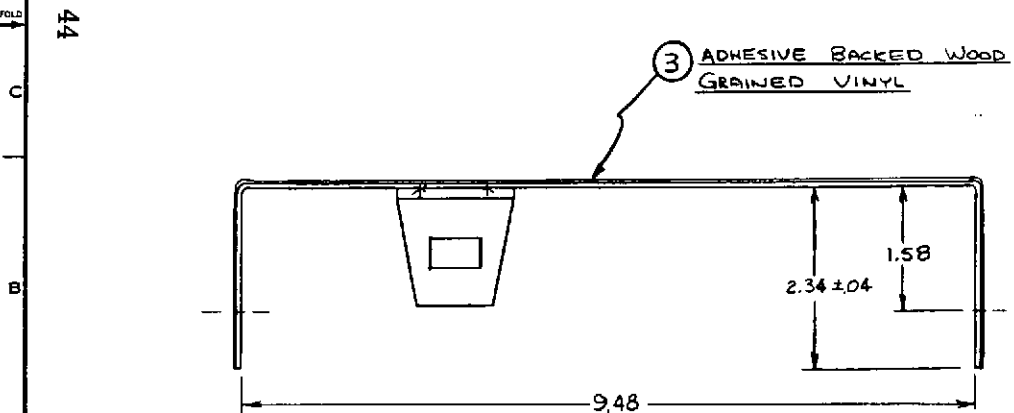
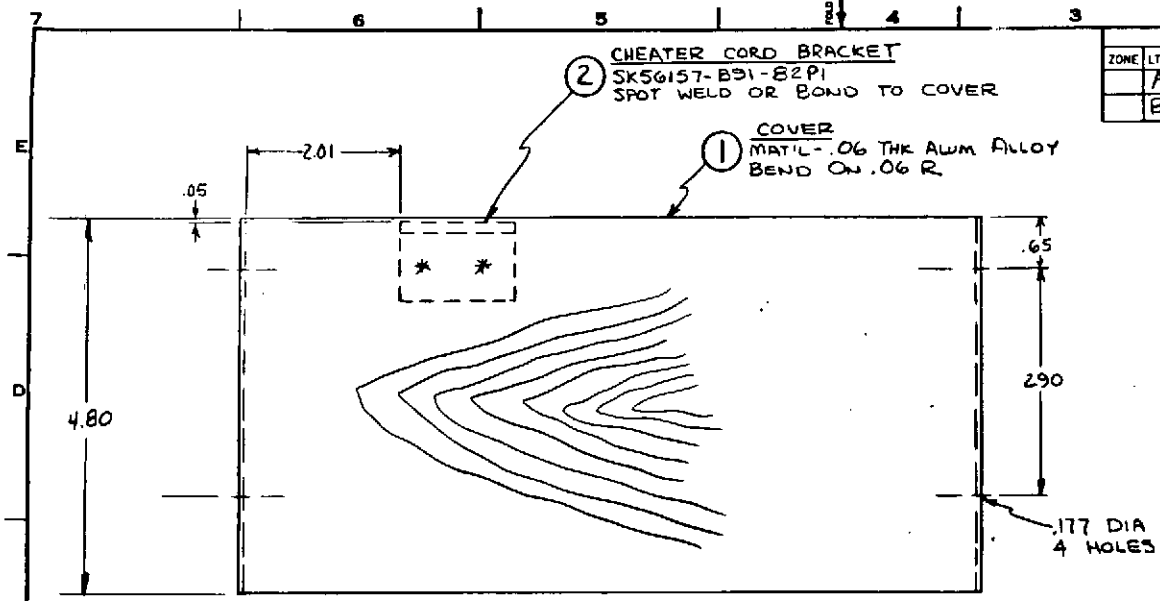
2.25 GHz AM GROUND UNIT

SIZE	CODE IDENT NO.
C	13688 SK56157-C91-80
SCALE	1 X
SHEET	

SHEET C

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
A		Z.26 WAS 2.66	6/8	w. J. Smith
B		ADDED PTS 2 & 3 AND NOTES	7/9	w. J. Smith

133



- ① NOTES:
- AFTER FASTENING BRACKET TO COVER FINISH ALL OVER WITH MATTE BLACK ANODIZE PER F65B68
 - REMOVE ANODIZE FROM EDGES TO EXPOSE BARE ALUMINUM AND APPLY VINYL OVER OUTSIDE SURFACES

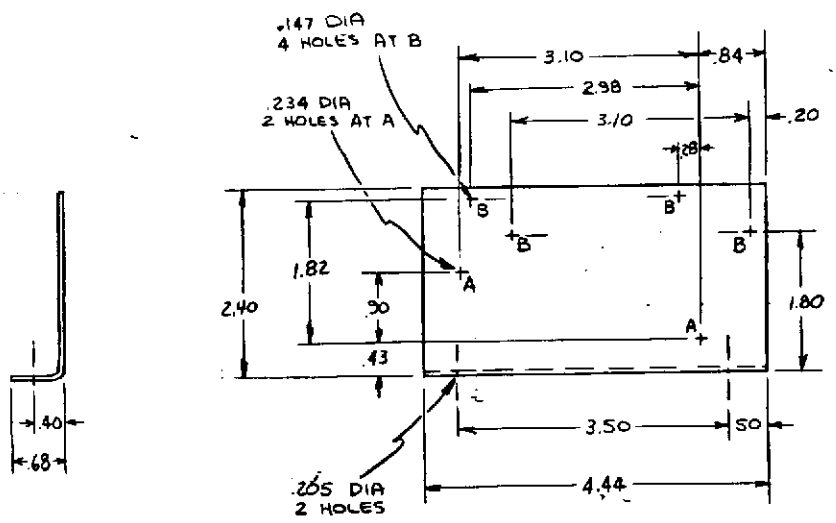
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES— TOLERANCES ON: 2-PLACE DECIMALS ± 3-PLACE DECIMALS ± ANGLES ± FRACTIONS ± MATERIAL—	ALL SURF. ✓	SIGNATURES		DATE	NO.	VER.
		DRAWN <i>w. J. Smith</i>		20	1	70
		CHECKED				
		FILED				
		DATE				
		BY	<i>w. J. Smith</i>	1	7	70
		SCALE				
GENERAL ELECTRIC E-LAB DEPT LOC SYRACUSE			COVER			
			12.0 & 2.25 GHz FM GROUND UNIT			
SIZE		CODE IDENT NO.				
C 13688		SK56157-C91-85				
SCALE 1X			SHEET			

7 6 5 4 3 2 1

SIZE C REV

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	ZONE D-5 - ADDED "B" HOLE; 1.80 DIM. LOCATING "B" HOLE WAS 1.30; .20 DIM. LOCATING "B" HOLE WAS .15; .147 DIA 4 HOLES @ "B" WAS .177 DIA 3 HOLES AT "B"; MAT'L WAS .09 THK.; BEND R. WAS .18; ADDED FINISH.	14 SEP 1970	<i>W. Jewett</i>

139



① MAT'L - .06 THK ALUM ALLOY
BEND ON .06 R.
FINISH - IRIDIUM PER F65E-GP4-P1

45

A

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES— TOLERANCES ON: 2-PLACE DECIMALS ± .02 3-PLACE DECIMALS ± .01 ANGLES ± 12.5' FRACTIONS ± MATERIAL—	SIGNATURES			DATE	REV	BY
	DESIGNED	<i>W. Jewett</i>		11	5	70
	CHECKED					
	ISSUED					
	ENGINEER	<i>J. Healy</i>		11	9	70
	DATE					
	SCALE					

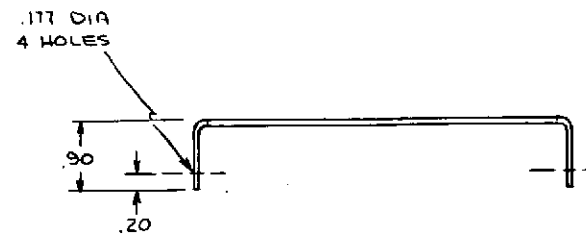
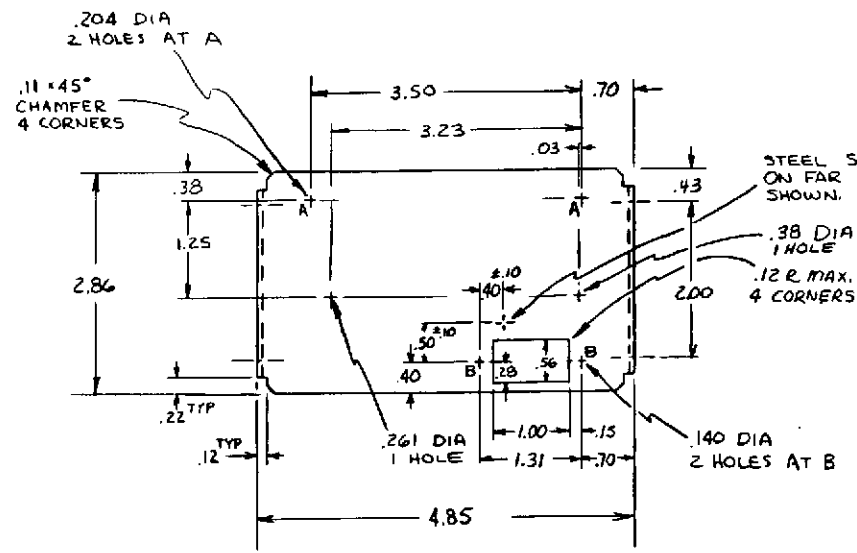
GENERAL ELECTRIC	
E-LAB	DEPT. LOC. SYRACUSE
BRACKET, CAVITY MTG. (12.0 GHZ FM ANTENNA UNIT)	
SIZE	CODE IDENT NO.
C 13688	SK56157-C91-88
SCALE 1X	SHEET

7 6 5 4 3 2 1

SIZE C

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROV. I.D.
A		MAT'L # BEND R WAS .09; ZONE B-G = .20 WAS .30; ADDED FINISH; MODIFIED CORNERS ADDED '+'; .261 DIA HOLE WAS .25; .38 DIM LOCATING 'A' HOLES WAS .30; .70 DIM LOCATING 'B' HOLES WAS .60; .56 CUTOUT WIDTH WAS .60; ADDED .38 DIA HOLE	14 SEPT 1970	<i>Dr. Jewett</i>

135



① MAT'L - .06 THK ALUM ALLOY
BEND ON .06 R
FINISH - CLEAR ANODIZE PER
F6582B

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES—
TOLERANCES ON:
2-PLACE DECIMALS ± .02 ALL SURF.
3-PLACE DECIMALS ± .005
ANGLES ± 125' ✓
FRACTIONS ±

MATERIAL—

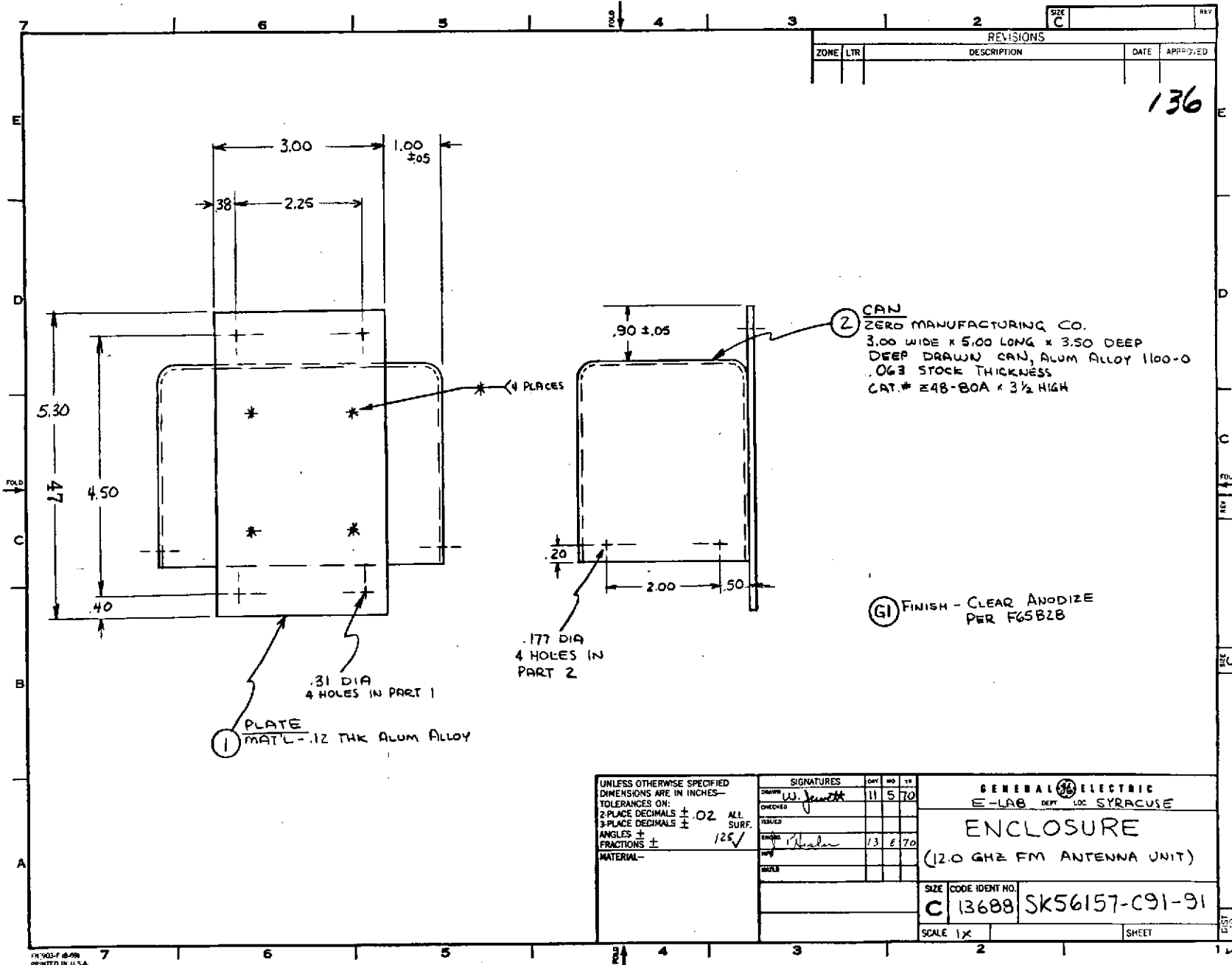
SIGNATURES		DAY	MO	YR
DRAWN	<i>Dr. Jewett</i>	11	5	70
CHECKED				
ISSUED				
ENGR'G	<i>J. H. ...</i>	15	7	70
APP'V				
MATER				

GENERAL ELECTRIC
E-LAB DEPT. 400 SYRACUSE

BASE PLATE
(120 GHZ FM ANTENNA UNIT)

SIZE CODE IDENT NO.
C 13688 SK56157-C91-89

SCALE 1 X SHEET



REV C		REV	
ZONE	LTR	DESCRIPTION	DATE

136

② CAN
 ZERO MANUFACTURING CO.
 3.00 WIDE X 5.00 LONG X 3.50 DEEP
 DEEP DRAWN CAN, ALUM ALLOY 1100-0
 .063 STOCK THICKNESS
 CAT.# Z48-80A X 3 1/2 HIGH

① FINISH - CLEAR ANODIZE
 PER F65B2B

① PLATE
 MAT'L - .12 THK ALUM ALLOY

.177 DIA
 4 HOLES IN
 PART 2

.31 DIA
 4 HOLES IN PART 1

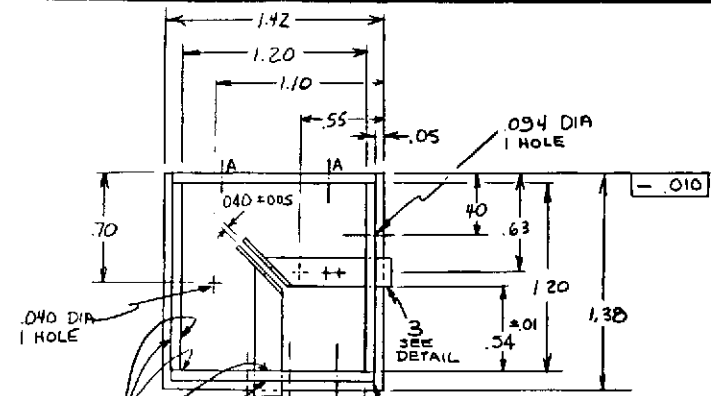
SIGNATURES			
DESIGNED	W. J. J...	CHKD	11 5 70
CHECKED			
TRACED			
ENG'D	M. Hader	13	6 70
APP'D			
SCALE			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES— TOLERANCES ON: 2-PLACE DECIMALS ± .02 ALL SURF. 3-PLACE DECIMALS ± .005 ANGLES ± 125' FRACTIONS ±		GENERAL ELECTRIC E-LAB DEPT. LOC. SYRACUSE	
ENCLOSURE (12.0 GHz FM ANTENNA UNIT)		SIZE CODE IDENT NO. C 13688 SK56157-C91-91	
MATERIAL—		SCALE 1X SHEET	

SIZE C REV

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
C2	A	.150 LIP HEIGHT PT 2 & 3 WAS .170	6/24/70	<i>[Signature]</i>
A6	B	ADDED GRAIN ORIENTATION	6/30/70	<i>[Signature]</i>
	C	ADDED 2 B HOLES & 1 A HOLE	8/2/70	<i>[Signature]</i>

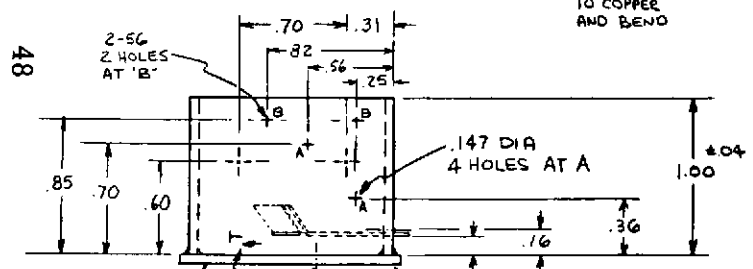
138



SOLDER
NOTE: MUST HAVE CONTINUOUS ELECTRICAL JOINT ON ALL INSIDE CORNERS OF BOX

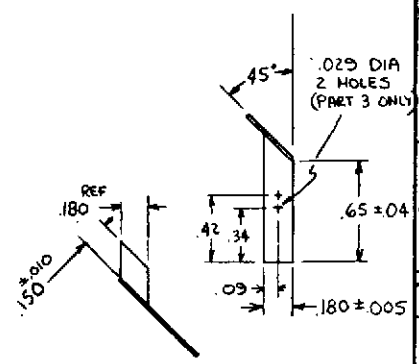
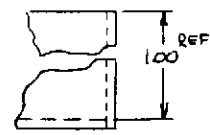
CORNER CONFIGURATION UNIMPORTANT. TYPICAL CORNERS SHOWN.

SAW CUT IN FLAT ALMOST TO COPPER AND BEND



1 BOX
MAT'L - .06 THK EPOXY GLASS WITH 2 OZ COPPER CLADDING BOTH SIDES

NOTE: GRAIN OF MAT'L USED IN SIDE PIECES MUST RUN PARALLEL TO BASE. GRAIN ORIENTATION IN BASE UNIMPORTANT



- 2 MAT'L - .020 THK COPPER BEND ON .02 R OMIT 2 HOLES
- 3 SAME AS PART 2 EXCEPT OTHER HAND ADD 2 HOLES

G1 FINISH - ELECTROLYSIS HOT TIN SHIPLEY CUPOSIT LT26 OR EQUIV

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES - TOLERANCES ON:
 2-PLACE DECIMALS ± .02
 3-PLACE DECIMALS ± .005
 ANGLES ± .5°
 FRACTIONS ± 1/16
 MATERIAL -

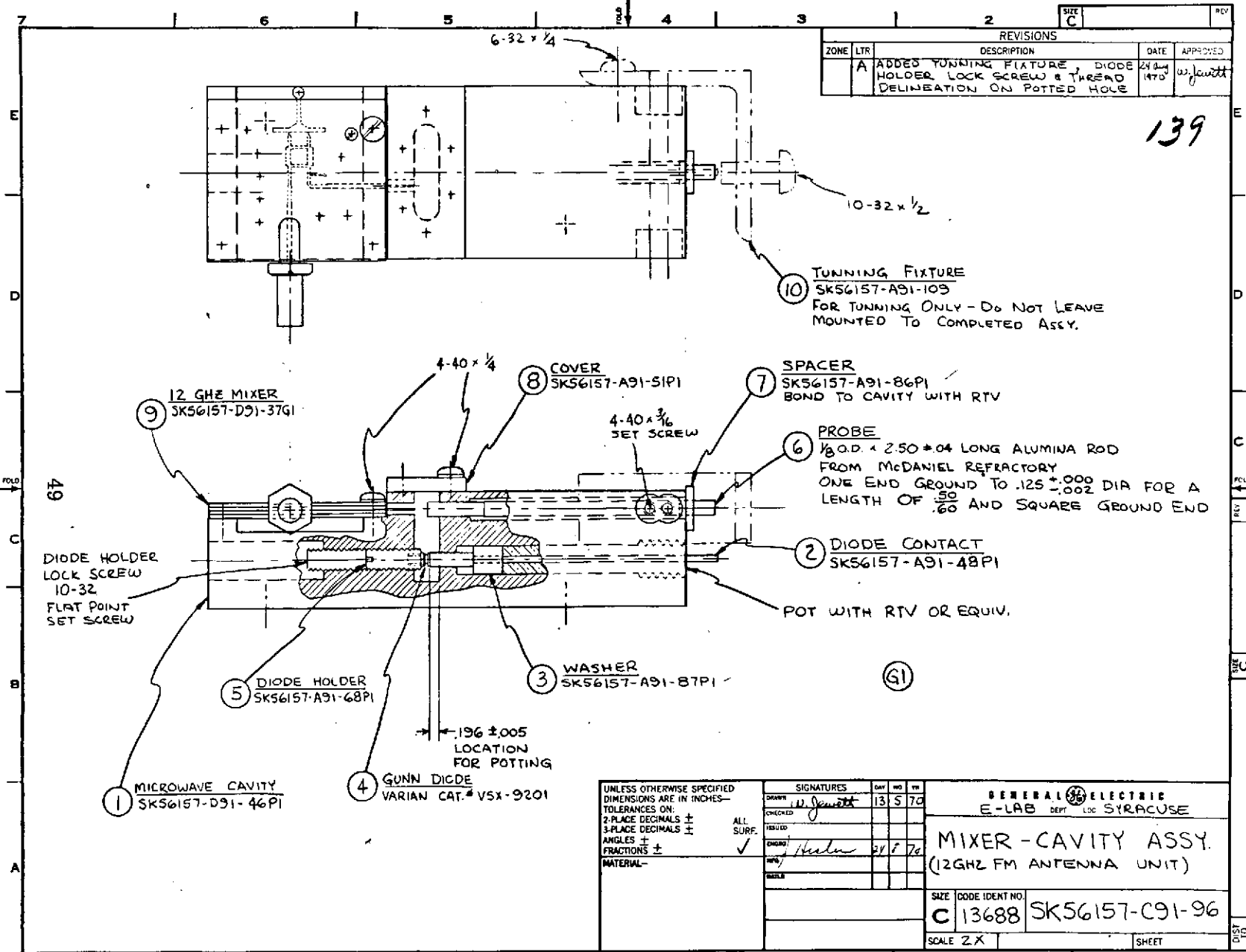
SIGNATURES		DATE	NO.	OF
DESIGN	<i>[Signature]</i>	9	6	70
CHECKED	<i>[Signature]</i>			
ISSUED				
ENG'G	<i>[Signature]</i>			
MFG				
MATER				

GENERAL ELECTRIC
 E-LAB DEPT LOC SYRACUSE

AIR LINE OSCILLATOR
 BOX
 (225 GHZ FM ANTENNA UNIT)

SIZE CODE IDENT NO.
 C 13688 SK56157-C91-95

SCALE SHEET



ZONE		LTR		DESCRIPTION	DATE	APPROVED
A				ADDED TUNNING FIXTURE, DIODE HOLDER, LOCK SCREW & THREAD DELINEATION ON POTTED HOLE	24 Aug 1970	W. J. J. J.

139

49

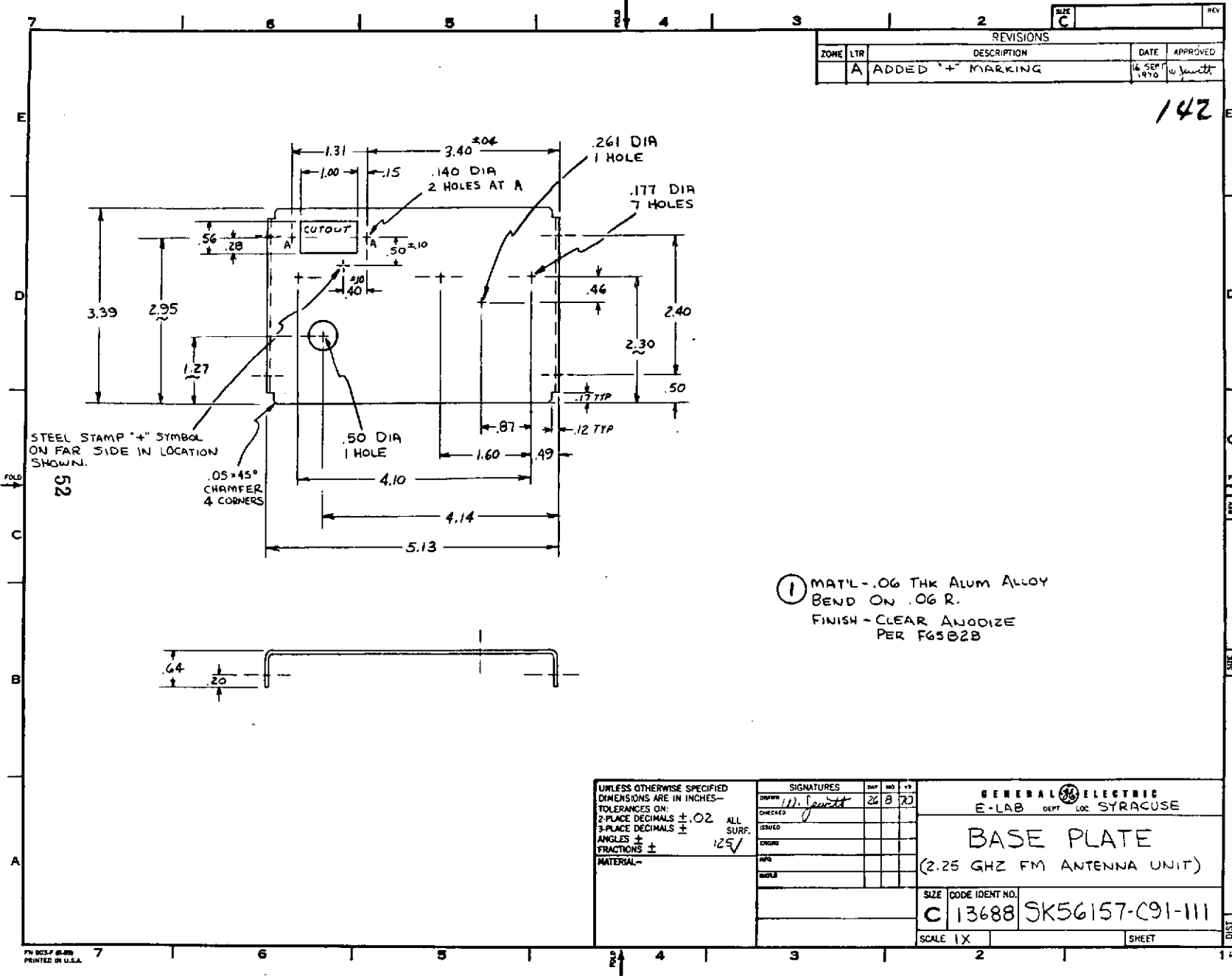
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES—
TOLERANCES ON:
2-PLACE DECIMALS ±
3-PLACE DECIMALS ±
ANGLES ±
FRACTIONS ±
MATERIAL—

SIGNATURES			
DRAWN	CHKD	APPD	BY
CHECKED	13	5	70
DESIGNED			
ENGRD			
BY			
DATE			

GENERAL ELECTRIC
E-LAB DEPT LOC SYRACUSE

MIXER-CAVITY ASSY.
(12GHZ FM ANTENNA UNIT)

SIZE	CODE IDENT NO	
C	13688	SK56157-C91-96
SCALE	2 X	
		SHEET



ZONE		LTR		DESCRIPTION	DATE	APPROVED
		A		ADDED '+' MARKING	16 SEP 1970	W. J. J. J.

142

① MAT'L - .06 THK ALUM ALLOY
 BEND ON .06 R.
 FINISH - CLEAR ANODIZE
 PER F65028

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES—
 TOLERANCES ON:
 2-PLACE DECIMALS ± .02 ALL SURF.
 3-PLACE DECIMALS ± .005
 ANGLES ± .125°
 FRACTIONS ± .005

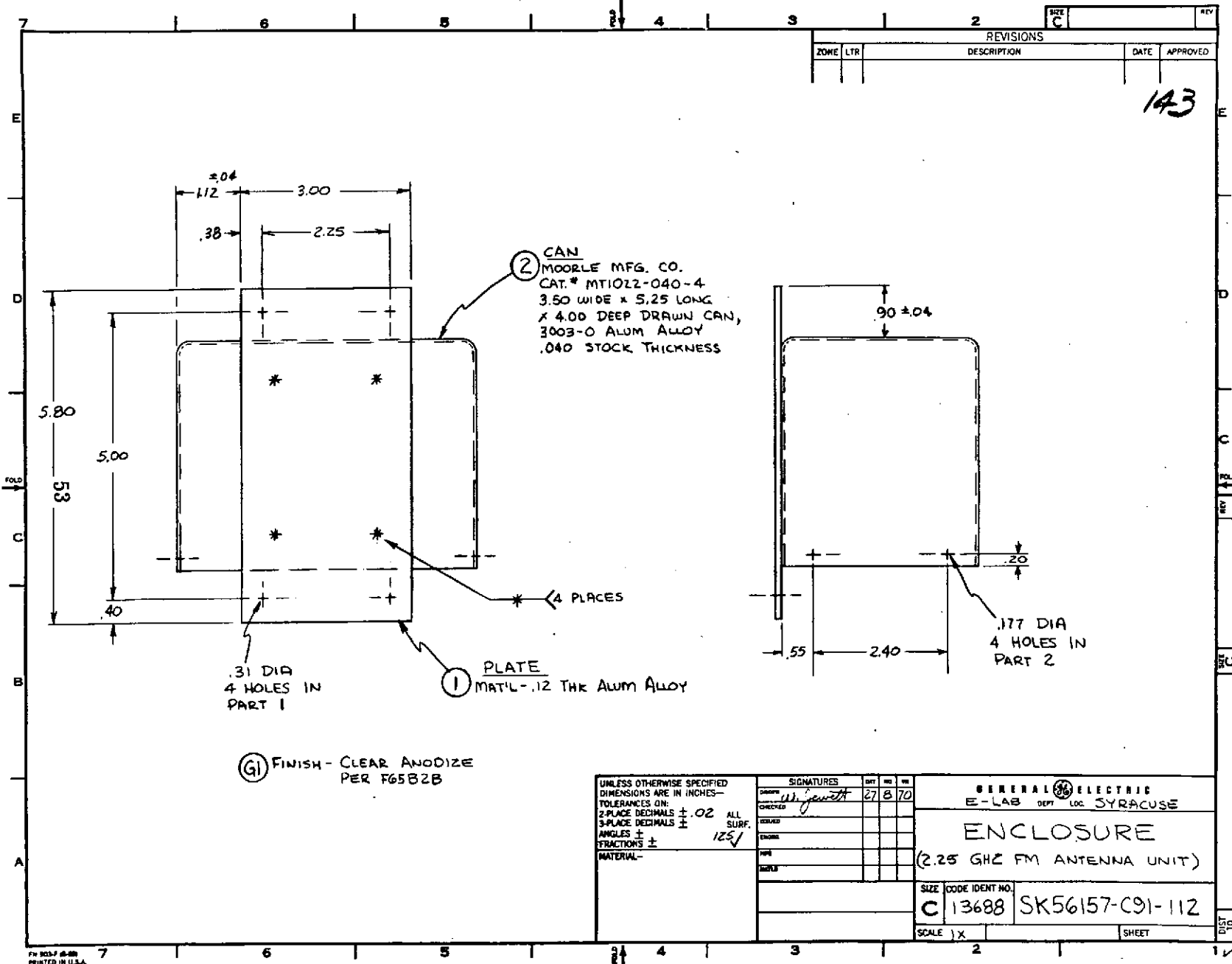
SIGNATURES		DATE	NO.	REV.
DRAWN	<i>W. J. J. J.</i>	26	8	70
CHECKED				
DESIGNED				
ENGINEER				
APP'D				
WORLD				

GENERAL ELECTRIC
 E-LAB DEPT LOC SYRACUSE

BASE PLATE
 (2.25 GHZ FM ANTENNA UNIT)

SIZE CODE IDENT NO.
C 13688 SK56157-C91-111

SCALE 1X SHEET



ZONE		LTR		DESCRIPTION	DATE	APPROVED

143

② CAN
MOORLE MFG. CO.
CAT. # MT1012-040-4
3.50 WIDE X 5.25 LONG
X 4.00 DEEP DRAWN CAN,
3003-O ALUM ALLOY
.040 STOCK THICKNESS

① PLATE
MATERIAL - .12 THK ALUM ALLOY

③ FINISH - CLEAR ANODIZE
PER F65B2B

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES—
TOLERANCES ON:
2-PLACE DECIMALS ± .02 ALL SURF.
3-PLACE DECIMALS ± .005
ANGLES ± 125'
FRACTIONS ±

SIGNATURES		DATE	BY	NO.
CHECKED	<i>W. Jewett</i>	27	B	70
DESIGNED				
ENGINEER				
DRAWN				

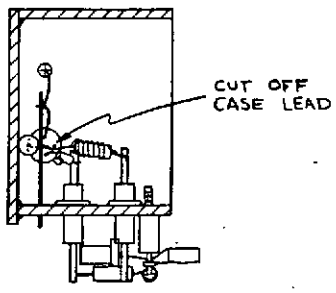
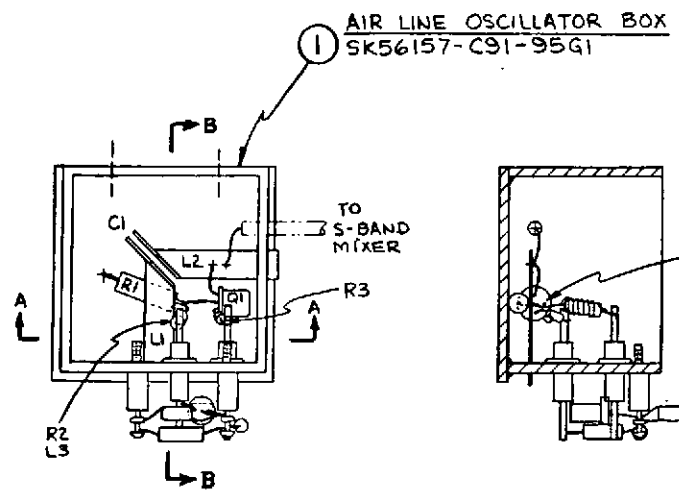
GENERAL ELECTRIC
E-LAB DEPT. LOC. SYRACUSE
ENCLOSURE
(2.25 GHz FM ANTENNA UNIT)

SIZE CODE IDENT NO.
C 13688 SK56157-C91-112

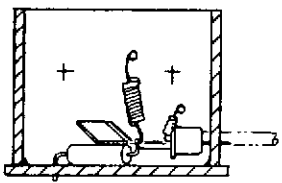
SCALE 1X SHEET

ZONE LTR		REVISIONS	DATE	APPROVED
A		ADDED STANDOFFS, L3, C3, Q2, R4, RT1 & R5	8 JAN 1971	<i>W. Jewett</i>

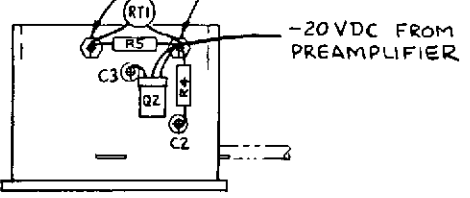
144



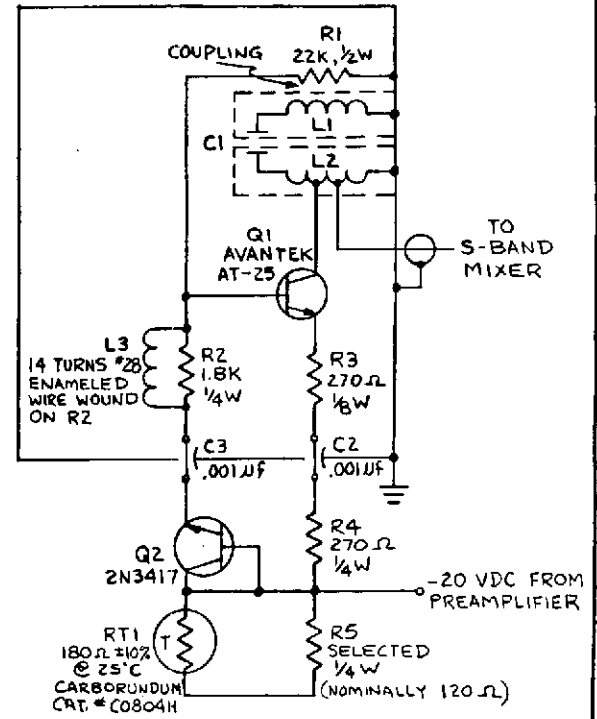
NOTE: IT IS IMPORTANT THAT COMPONENTS INSIDE THE BOX BE POSITIONED AS SHOWN



STANDOFF WHITSO CAT. #4D5-A1

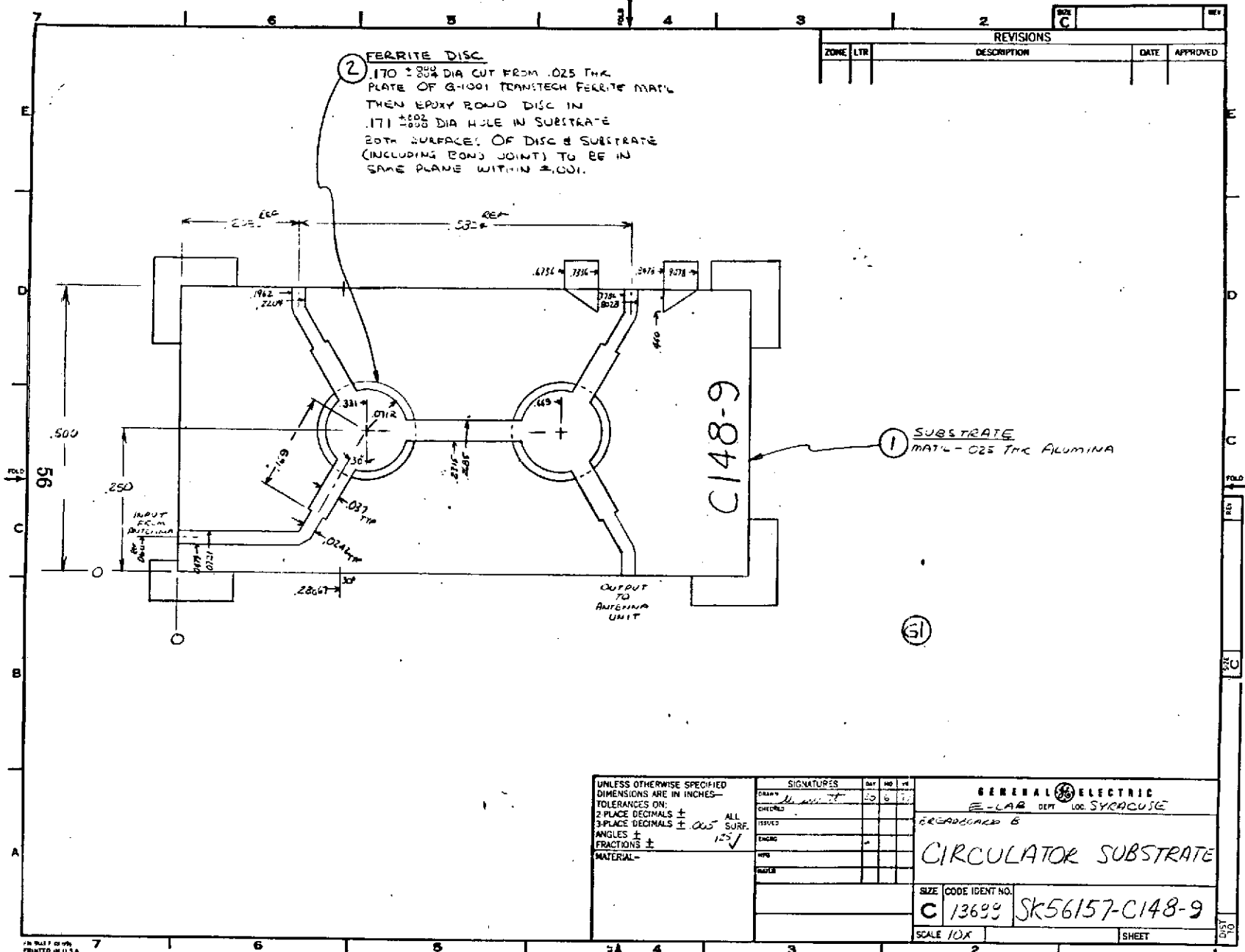


(G1) SERIALIZE BY RUBBER STAMPING OR ENGRAVING WITH "SFM 1" THRU "SFM 10"



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES—	SIGNATURES			
	CHKD	APP	REV	REV
TOLERANCES ON:	<i>W. Jewett</i>	28	8	72
2-PLACE DECIMALS ±				
3-PLACE DECIMALS ±				
ANGLES ±				
FRACTIONS ±				
MATERIAL—				

GENERAL ELECTRIC	
E-LAB	DEPT. LOC. SYRACUSE
AIR LINE OSCILLATOR ASSY	
(2.25 GHz FM ANTENNA UNIT)	
SIZE	CODE IDENT NO.
C 13688	SK56157-C91-113
SCALE 2 X	SHEET



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES—
 TOLERANCES ON:
 2 PLACE DECIMALS ±
 3 PLACE DECIMALS ± .005 ALL SURF.
 ANGLES ± 125'
 FRACTIONS ±
 MATERIAL—

SIGNATURES			
DRAWN	CHECKED	DATE	NO. OF REV.
<i>[Signature]</i>		50	6

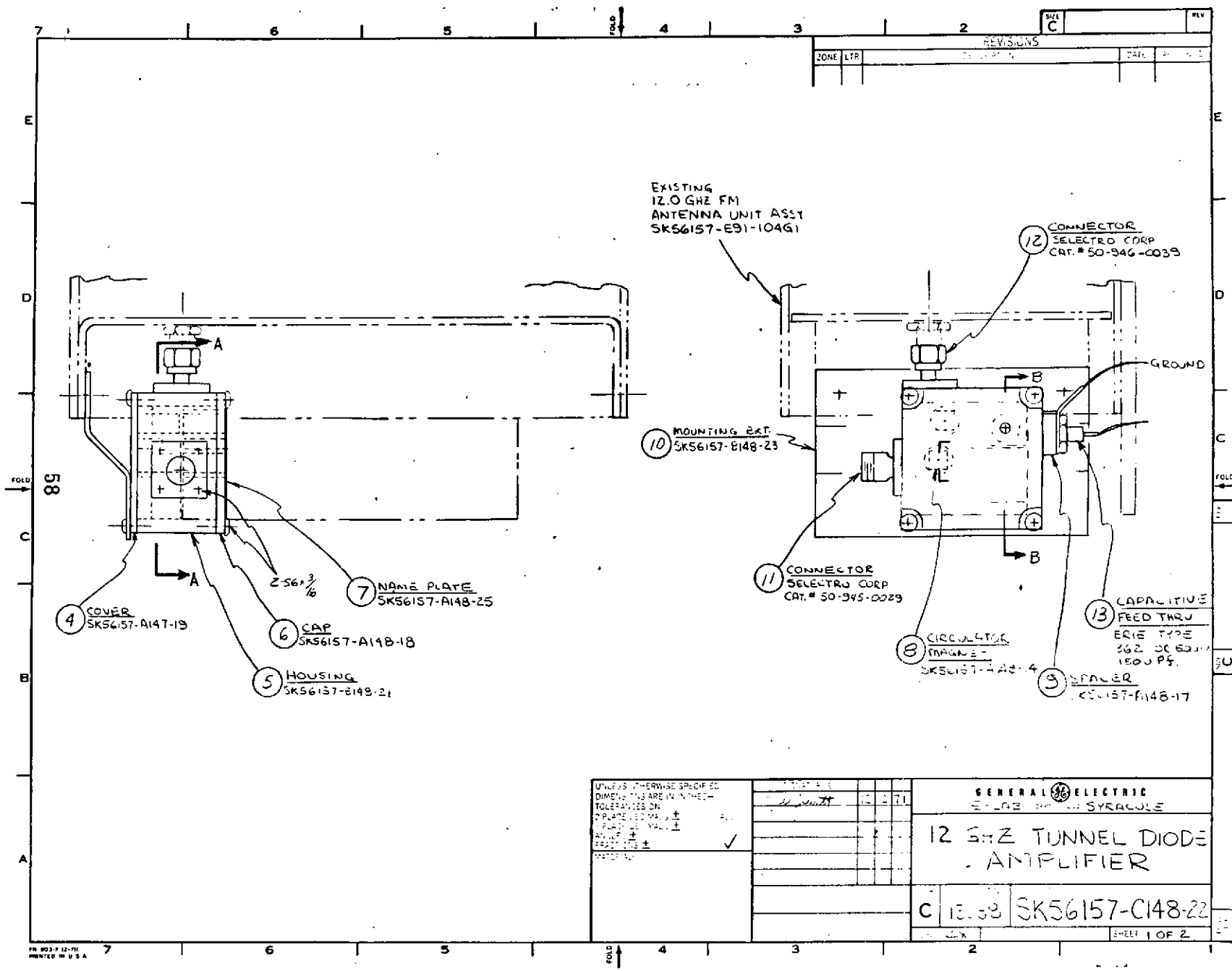
GENERAL ELECTRIC
 E-LAB DEPT. LOC. SYRACUSE

CREATED BY

CIRCULATOR SUBSTRATE

SIZE CODE IDENT NO.
C 13699 SK56157-C148-9

SCALE 10X SHEET



UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
PLACEMENTS ON
PLACEMENTS ON
PLACEMENTS ON
PLACEMENTS ON
PLACEMENTS ON

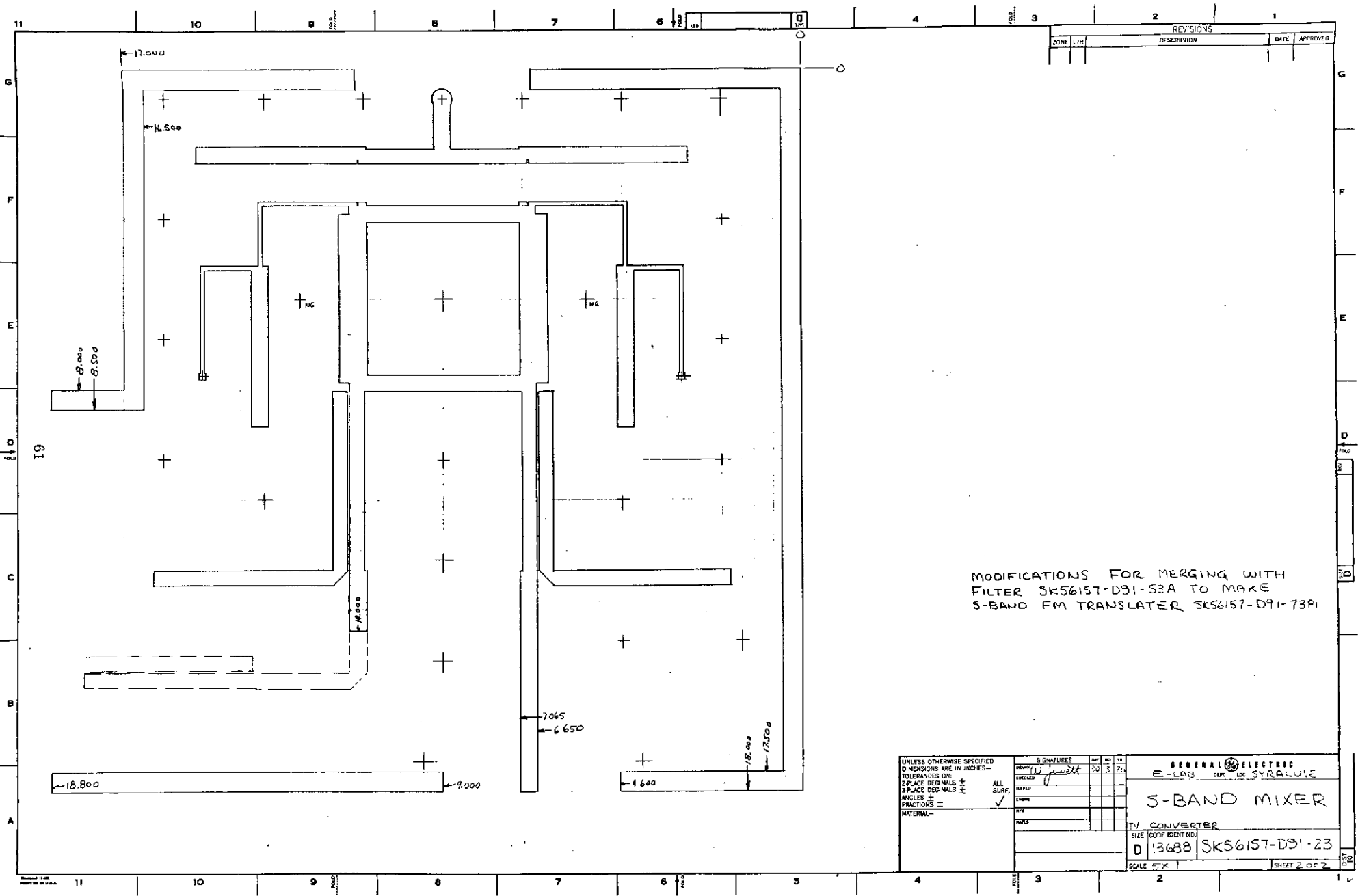
DATE	BY	CHKD	APP'D
11/27	GS	TL	

GENERAL ELECTRIC
SYRACUSE, NEW YORK

12 GHz TUNNEL DIODE
AMPLIFIER

C 13.38 SK56157-C148-22

SHEET 1 OF 2

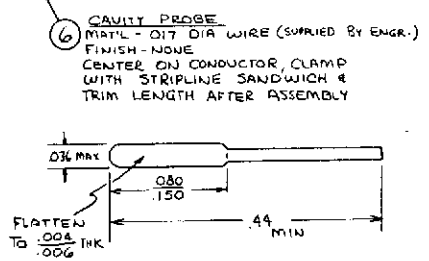
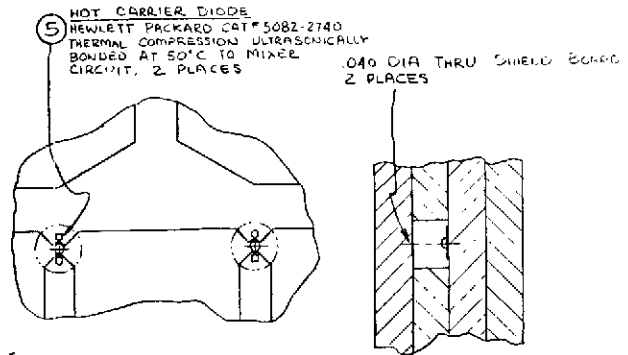
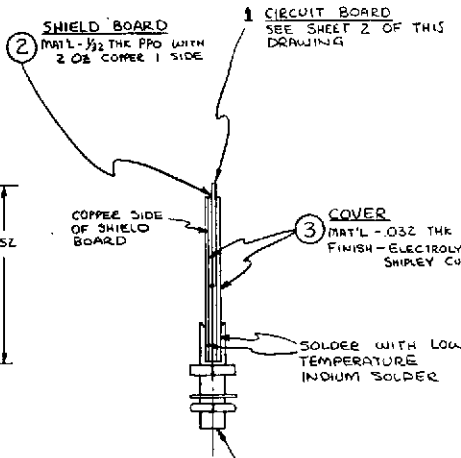
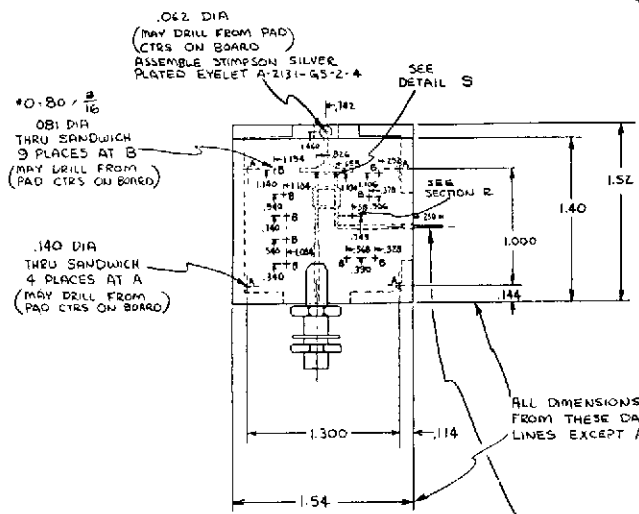
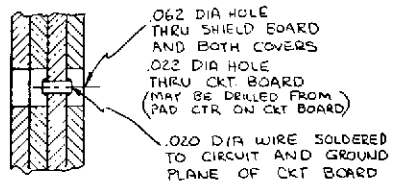


REVISIONS				
ZONE	U/R	DESCRIPTION	DATE	APPROVED

MODIFICATIONS FOR MERGING WITH
 FILTER SK56157-D91-S3A TO MAKE
 S-BAND FM TRANSLATER SK56157-D91-73P1

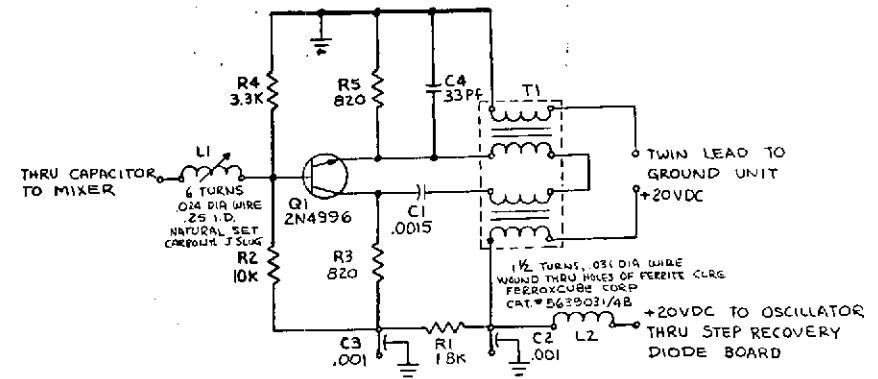
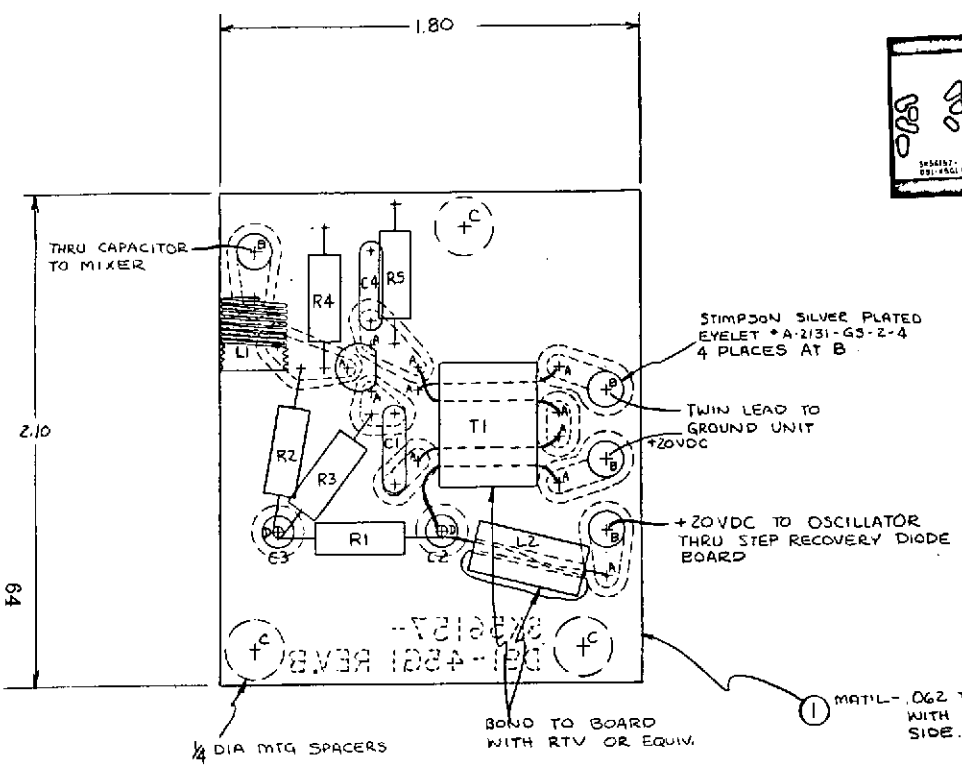
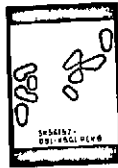
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES— TOLERANCES ON: 2-PLACE DECIMALS ± 3-PLACE DECIMALS ± ANGLES ± FRACTIONS ± MATERIAL—	SIGNATURES		DATE	BY
	DESIGNED	<i>W. J. Smith</i>	30	3 76
	CHECKED			
	ILLUSTRATED			
	ALL SURF.	✓		
	DATE			
	SCALE	2X		
GENERAL ELECTRIC		E-LAB DEPT. LOC. SYRACUSE		
S-BAND MIXER		TV CONVERTER		
SIZE	CODE IDENT. NO.	D 13688 SK56157-D91-23		
SCALE	2X	SHEET 2 OF 2		

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES: ON 3 PLACE DECIMALS ± .02 ALL 3 PLACE DECIMALS ± .005 SUPP. ANGLES ± 12.5/ FRACTIONS ± MATERIAL -	SIGNATURES		REV	NO	DATE
	DESIGNED BY	DATE	13	5	7
	CHECKED BY	DATE			
	APPROVED BY	DATE			
GENERAL ELECTRIC E-LAB DEPT LOC SYRACUSE					
120 GHz MIXER (120 GHz FM ANTENNA UNIT)					
SIZE	CODE IDENT NO	SCALE 2X			
D	13688	SK56157-D91-37			
SHEET 1 OF 2					

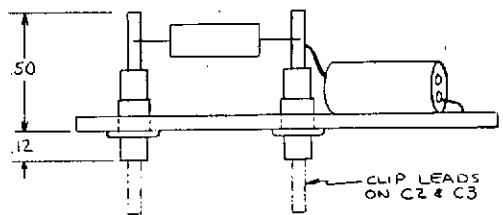
ZONE		REV	DESCRIPTION	DATE	APPROVED
A		1	REDRAWN FROM 'C' SIZE WITH GENERAL CHANGES	28 NOV 1970	W. J. ...
B		2	MODIFIED BOARD CONFIGURATION AND ADDED NOTES	2 JUN 1971	W. J. ...
C R1 CHANGED TO 18K					27 JUN 1972



NOTES:
 1. ALL RESISTOR VALUES IN OHMS, 1/2 WATT, TOL ± 15%
 2. ALL CAPACITOR VALUES ARE IN MICRO FARADS EXCEPT AS NOTED.

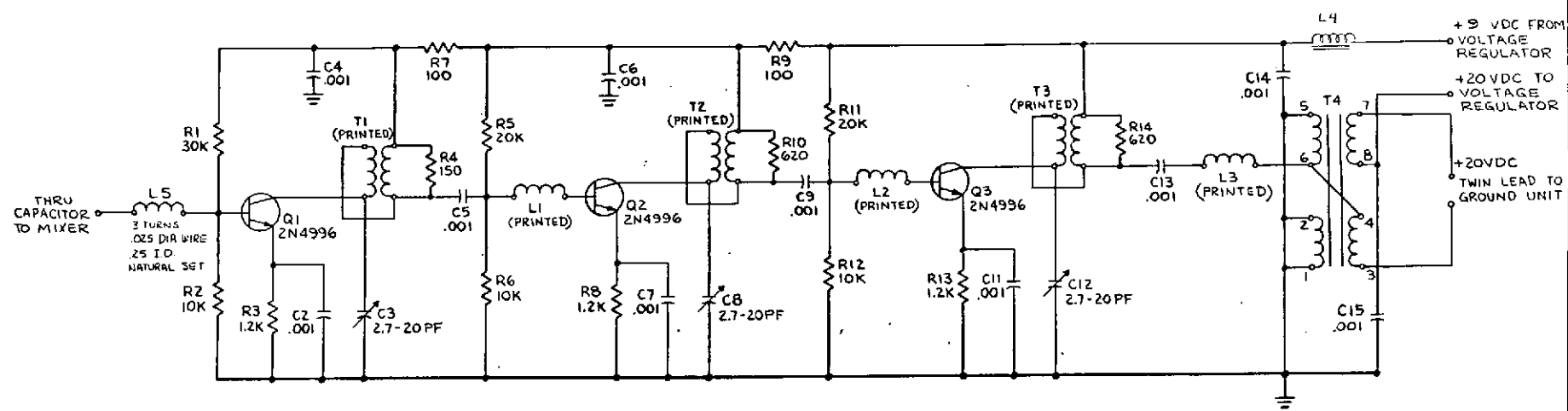
SYMBOL	DESCRIPTION	QTY
	ALL UNLABELED HOLES .040 DIA	12
A	.025 DIA	11
B	.063 DIA	4
C	.140 DIA	3
D	.147 DIA	2

(G) NOTES:
 1. PRIOR TO COMPONENT ASSEMBLY APPLY ELECTROLYSIS HOT TIN TO ALL COPPER SURFACES OF PRINTED BOARD. SHIPLEY CUPOSIT LT26 TIN OR EQUIV.
 2. DO NOT ASSEMBLE ANY FLYING LEADS.
 3. SERIALIZE BOARDS BY RUBBER STAMPING AS APPLICABLE "SAM 1" THRU "SAM 10".



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES - TOLERANCES ON: 3 PLACE DECIMALS ± 2 PLACE DECIMALS ± ANGLES ± FRACTIONS ± MATERIAL -	SIGNATURES DESIGNED BY: [Signature] CHECKED BY: [Signature] DRAWN BY: [Signature] DATE: 11/28/70	GENERAL ELECTRIC E-LAB IF PREAMPLIFIER (2.25 GHZ AM ANTENNA UNIT)
SCALE 4X	SHEET 1	DATE CODE IDENT NO D 13688 SK56157-D91-45

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
B		REDRAWN WITH GEN. CHG. INCLUDING ADDITION OF 1 AMP STAGE AND OUTPUT TO V.REG DELETED. CIO	6/26/70	W. J. [unclear]
C		Delete R-5 Add L-4	5/10/73	J.P. [unclear]



NOTES
 1. ALL RESISTOR VALUES ARE IN OHMS, TOLERANCE $\pm 10\%$, $\frac{1}{2}$ WATT EXCEPT AS NOTED.
 2. ALL CAPACITOR VALUES ARE IN MICRO-FARADS EXCEPT AS NOTED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES—
 TOLERANCES ON:
 2-PLACE DECIMALS \pm
 3-PLACE DECIMALS \pm
 ANGLES \pm
 FRACTIONS \pm
 MATERIAL—

SIGNATURES	DATE	NO.
W. JEWETT	5/1/70	

FOR ASSY DWG SEE SK56157-091-55

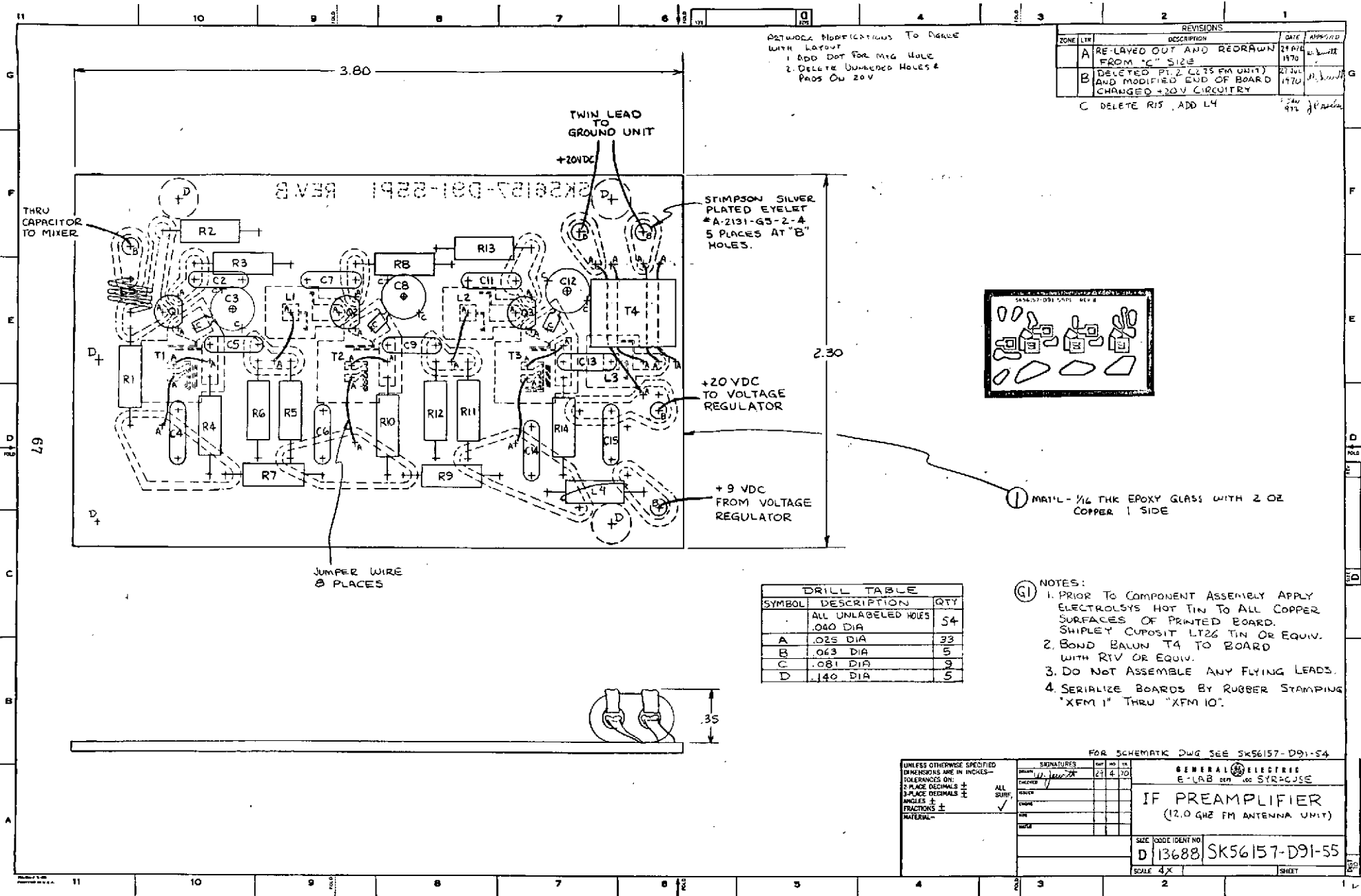
GENERAL ELECTRIC
 E-LAB DEPT. OF STRUCO

SCHEMATIC DIAGRAM
 IF PREAMPLIFIER
 (12.0 GHz FM ANTENNA UNIT)

TV CONVERTER
 SIZE CODE IDENT NO.
 D 13698 SK56157-D91-54

SCALE SHEET

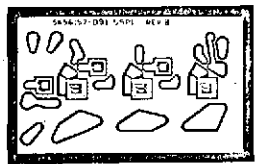
LAST USED
 P15
 C16
 Q3
 T4
 L3
 C10
 C16



ADJUSTABLE MODIFICATIONS TO DESIGN WITH LAYOUT

1. ADD DOT FOR MFG HOLE
2. DELETE NUMBERED HOLES & PADS ON 20V

REVISIONS		DATE	APPROVED
ZONE	DATE	DESCRIPTION	
A	27 JUL 1970	RE-LAYED OUT AND REDRAWN FROM "C" SIZE	[Signature]
B	27 JUL 1970	DELETED PT. 2 (2.25 FM UNIT) AND MODIFIED END OF BOARD CHANGED +20V CIRCUITRY	[Signature]
C	1 JAN 1972	DELETE R15, ADD L4	[Signature]



DRILL TABLE		
SYMBOL	DESCRIPTION	QTY
.	ALL UNLABELED HOLES .040 DIA	54
A	.025 DIA	33
B	.063 DIA	5
C	.081 DIA	9
D	.140 DIA	5

- NOTES:
1. PRIOR TO COMPONENT ASSEMBLY APPLY ELECTROLYSIS HOT TIN TO ALL COPPER SURFACES OF PRINTED BOARD. SHIPLEY CUPOSIT LT26 TIN OR EQUIV. WITH RIV OR EQUIV.
 2. BOND BALUN T4 TO BOARD
 3. DO NOT ASSEMBLE ANY FLYING LEADS.
 4. SERIALIZE BOARDS BY RUBBER STAMPING "XFM 1" THRU "XFM 10".

FOR SCHEMATIC DWG SEE SK56157-D91-54

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES—	SIGNATURES	DATE	NO	BY
TOLERANCES ON:	DESIGNER	27	4	70
2-PLACE DECIMALS ±	CHECKER			
3-PLACE DECIMALS ±	DRIVER			
ANGLES ±	CHANG			
FRACTIONS ±	APP			
MATERIAL—	WFLD			

GENERAL ELECTRIC
E-LAB DIV. LOS ANGELES

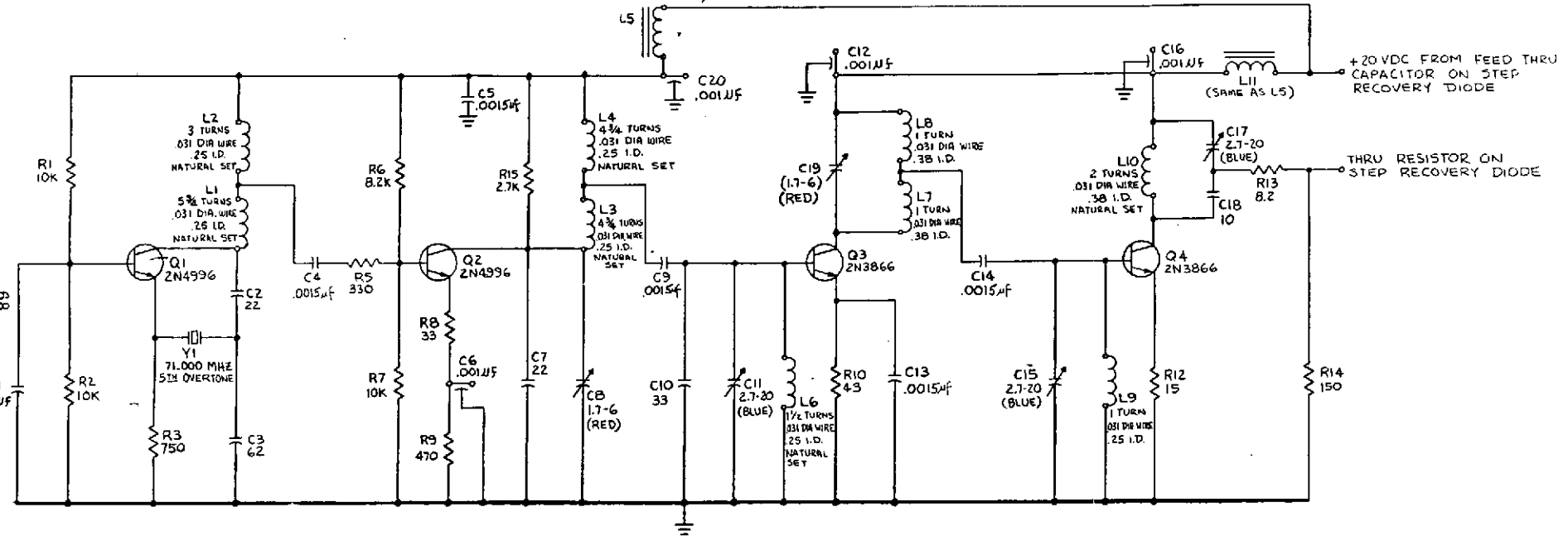
IF PREAMPLIFIER
(12.0 GHz FM ANTENNA UNIT)

SIZE CODE IDENT NO
D 13688 SK56157-D91-55

SCALE 4X SHEET

REVISIONS		DATE	APPROVED
C	REDRAWN WITH GEN. CHGS.	3/30/70	[Signature]
D	CRYSTAL CIRCUITRY CHG.	3/01/70	[Signature]
E	ADDED C20; DELETED R4 BETWEEN C19 & C16; L5 WAS CONNECTED TO C11	1/17/71	[Signature]
F	R CA, C5, C9, C13, C14 CHANGED TO 20% CAP	1/17/71	[Signature]

1 1/2 TURNS, .031 DIA WIRE,
WOUND THRU HOLE OF FERRITE CORE
FERROXIDE CORE
CAT.# 5433031/4B



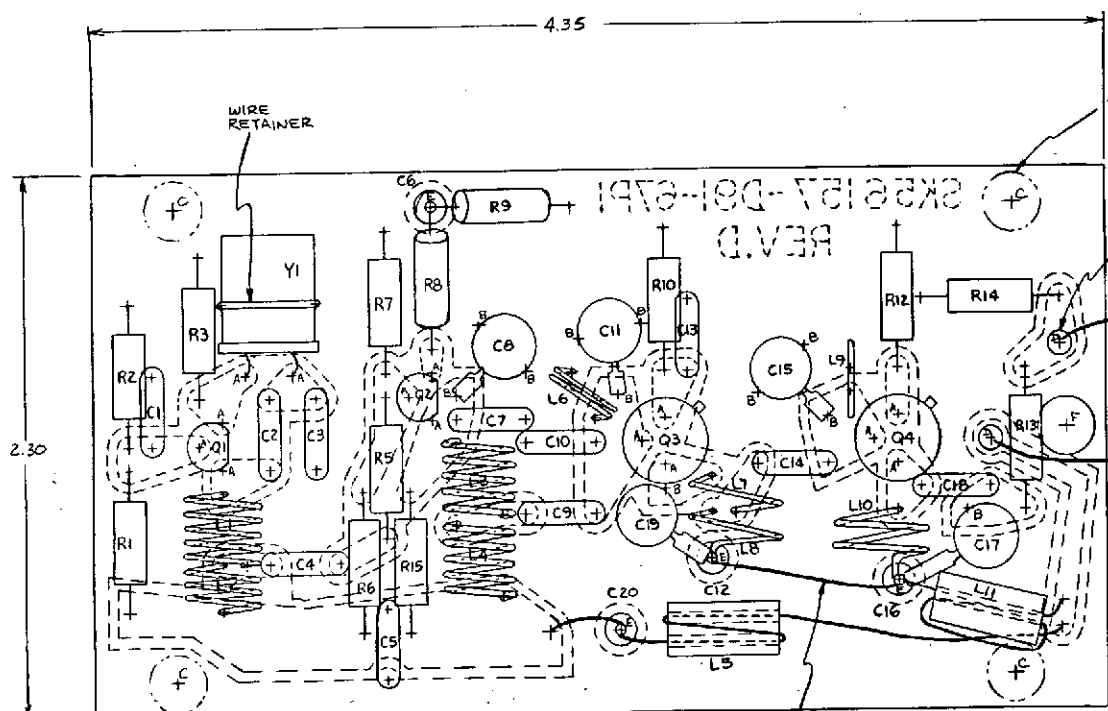
- NOTES:
1. ALL RESISTOR VALUES ARE IN OHMS, ±10% TOLERANCE, 1/2 WATT EXCEPT AS NOTED.
 2. ALL CAPACITOR VALUES ARE IN PICO FARADS EXCEPT AS NOTED.

FOR ASSY DRAWING SEE SK56157-D91-67

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES—TOLERANCES ON: 2-PLACE DECIMALS ± 3-PLACE DECIMALS ± ANGLES ± FRACTIONS ±	SIGNATURES DESIGNED BY: [Signature] DRAWN BY: [Signature] CHECKED BY: [Signature] DATE: [Date]	REV. NO. 3/3/70
GENERAL ELECTRIC E-LAB INC. SYRACUSE		
S-BAND CRYSTAL OSCILLATOR & TRIPLER (2.25 GHz AM ANTENNA UNIT)		
SIZE CODE IDENT NO. D 13688	SK56157-D91-66	
SCALE	SHEET	

LAST USED: C20, Q4, R15
NOT USED: R9, R11

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
C		REDRAWN WITH GEN CHGS	11/20/66	[Signature]
D		GENERAL CHANGES IN AREA OF Q1	13 Oct 1970	[Signature]
E		JUMPER BETWEEN C12 & C16 W/RS R11 ADD C20 AND RELOCATED L5	12 JAN 1971	[Signature]

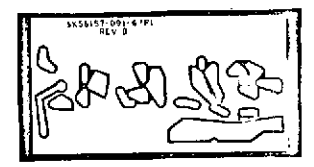


OUTLINE OF .25 DIA MFG SPACER

ASSEMBLE STIMPSON SILVER PLATED EYELET *A-2131-GS-2-4 2 PLACES AT D

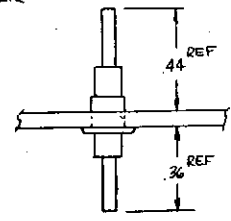
THRU RESISTOR TO STEP RECOVERY DIODE

+20 VDC FROM FEED THRU CAPACITOR ON STEP RECOVERY DIODE



DRILL TABLE		
SYMBOL	DESCRIPTION	QTY
	ALL UNLABELED HOLES	67
	.040 DIA	
A	.025 DIA	14
B	.081 DIA	11
C	.140 DIA	4
D	.063 DIA	2
E	.147 DIA	4
F	.25 DIA	1

- NOTES:
1. PRIOR TO COMPONENT ASSEMBLY APPLY ELECTROLYSIS HOT TIN TO ALL COPPER SURFACES OF PRINTED BOARD. SHIPLEY CUPOSIT LT26 TIN OR EQUIV.
 2. BOND COILS L5 & L11 TO BOARD WITH RTV OR EQUIV.
 3. VARIABLE CAPACITORS C13 & C17 - CUT OFF OR BEND UNUSED LEAD OUT OF WAY.
 4. DO NOT ASSEMBLE ANY FLYING LEADS.
 5. SERIALIZE BOARDS BY RUBBER STAMPING WITH *SAM 1* THRU *SAM 10*.



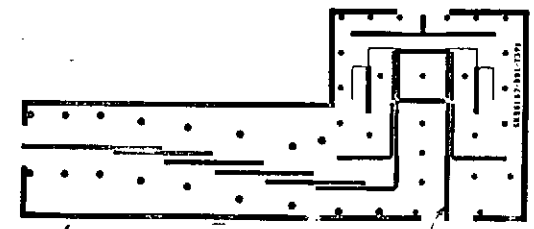
1 PRINTED CIRCUIT BOARD
MATERIAL - 1/16 THK EPOXY GLASS WITH 2 OZ COPPER ONE SIDE.

FOR SCHEMATIC DIAG SEE SK56157-D91-66

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES - TOLERANCES ON: 12 PLACE DECIMALS ± .02 ALL SURF. ANGLES ± FRACTIONS ± MATERIAL -	DESIGNED BY	DATE	REV	GENERAL ELECTRIC E-LAB DIV. IN SYRACUSE S-BAND CRYSTAL OSCILLATOR & TRIPLER (2.25 GHz AM ANTENNA UNIT) SIZE (CODE IDENT NO.) D 13688 SK56157-D91-67 SCALE: 4X SHEET
	CHECKED BY			
	DATE			
	BY			

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

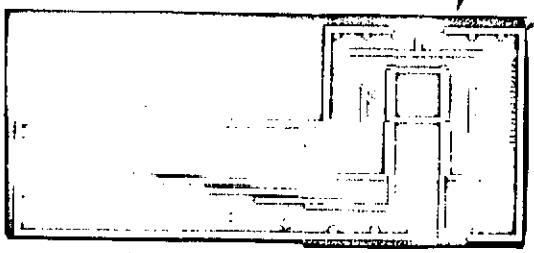
①
NEAR SIDE ARTWORK
225 GHz FM FILTER-MIXER



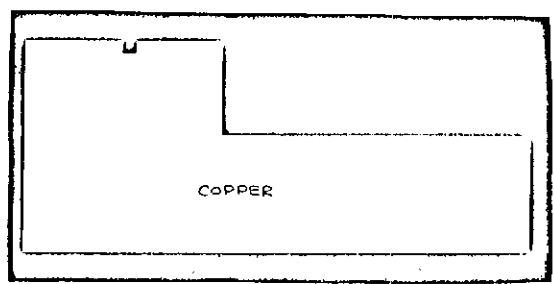
FILTER DIMENSIONS
PER SK56157-D91-53A

MIXER DIMENSIONS
PER SK56157-D91-23

②
NEAR SIDE ARTWORK
225 GHz AM FILTER-MIXER
(SAME AS PART 1 EXCEPT
FILTER 2% SMALLER)



FILTER DIMENSIONS
PER SK56157-D91-53A
EXCEPT FILTER LINES
PHOTOGRAPHICALLY REDUCED 2%
(HOLES & OUTLINE IN SAME LOCATION)

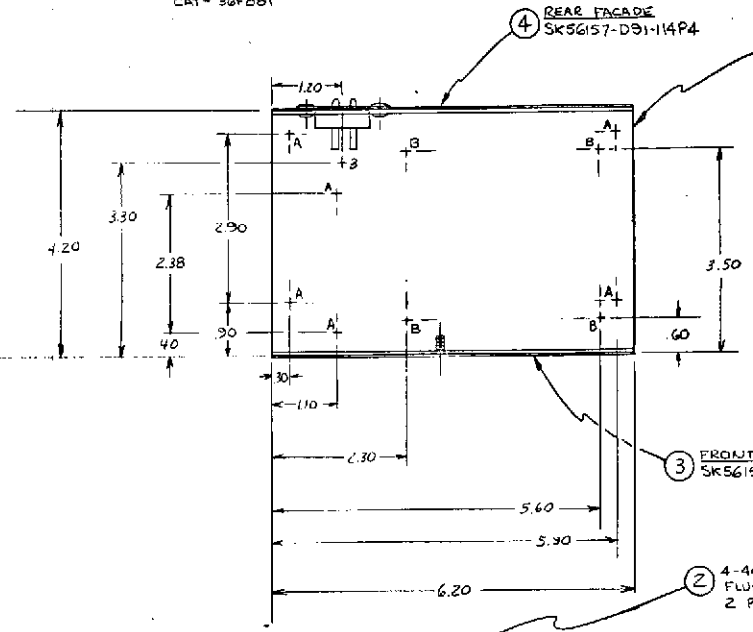
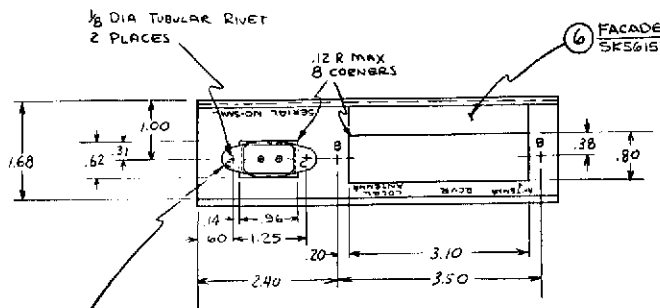


FAR SIDE ARTWORK
225 GHz AM & FM FILTER MIXER

- NOTES :
1. MAT'L - 062 THE PPO WITH 2 Oz COPPER BOTH SIDES
 2. FOR MACHINING SEE SK56157-E91-97
 3. FOR ASSEMBLY SEE SK56157-

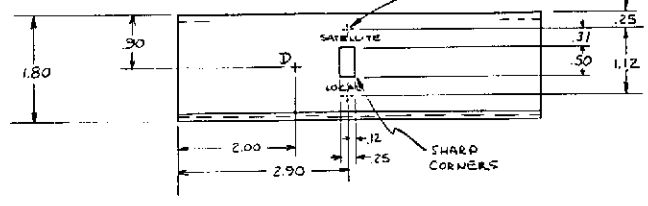
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES— TOLERANCES ON: 2-PLACE DECIMALS ± 3-PLACE DECIMALS ± ANGLES ± FRACTIONS ± MATERIAL—	APPROVED	DATE	GENERAL ELECTRIC E-LAB DEPT. OF SYRACUSE S-BAND FILTER-MIXER ARTWORK
	CHECKED	14/7/72	
	DESIGNED		
	ENG'G		
	SIGNATURES	DATE	SIZE
			D 13689
			SCALE 1X
			SHEET

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
A		GEN. CHAS INCLUDING REMOVAL OF 2" HOLES & VENTILATION HOLES ADDITION OF FACADE PRESS IN STUDS CHASSIS FINISH & NOTES	5 MAY 1970	W. J. JAWIT
B		CORRECTED FACADE CALLOUTS	12 MAY 1970	W. J. JAWIT



SYMBOL	DESCRIPTION	QTY
A	.177 DIA	6
B	.144 DIA	7
C	.136 DIA	2
D	.309 DIA	1

(G) NOTES:
1. ASSEMBLE CHEATER CORD RECEPTICAL AFTER ASSEMBLY OF REAR FACADE.



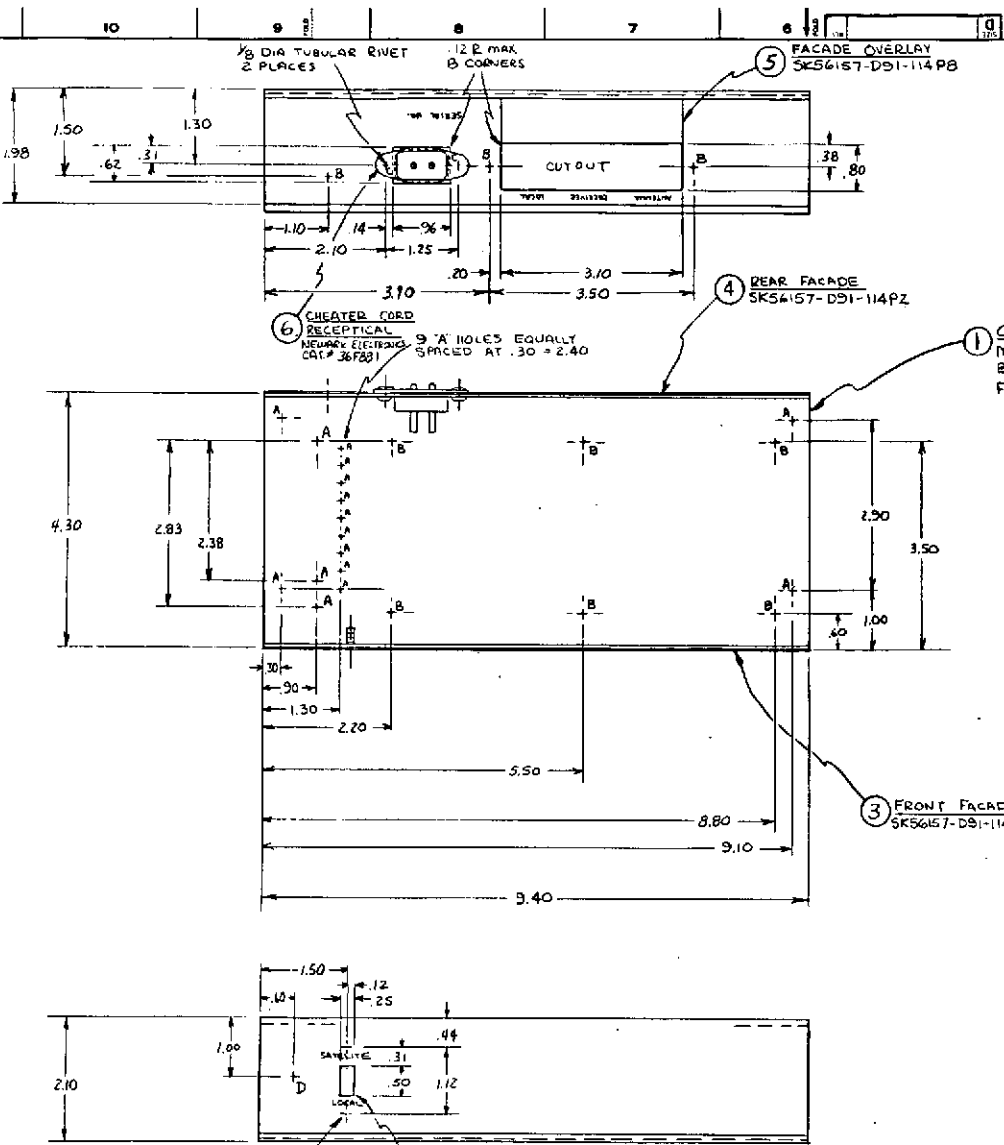
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES—
TOLERANCES ON:
DIMENSIONS ON: 2 PLACE DECIMALS
3 PLACE DECIMALS ±
ANGLES ±
FRACTIONS ±
MATERIAL—

SIGNATURES			
DESIGN	DATE	CHK	APP
W. J. JAWIT	11 4 70		
CHAS		5 5 70	
DRWG			
APP			
DATE			
SCALE			

GENERAL ELECTRIC
E-LAB, NEW YORK, N.Y.
CHASSIS
(2.25 GHz AM GROUND UNIT)

SIZE CODE IDENT NO:
D 13689 SK56157-D91-79
SCALE: X SHEET

712



REVISIONS			
ZONE	LTR	DESCRIPTION	DATE
A		GENERAL CHANGES	4/8
B		GENERAL CHANGES	7/4
C		CORRECTED FACADE CALLOUTS	7/5

DRILL TABLE		
SYMBOL	DESCRIPTION	QTY
A	.177 DIA	16
B	.144 DIA	9
C	.136 DIA	2
D	.309 DIA	1

(G) NOTES:
 1. ASSEMBLE CHEATER CORD RECEPTAL AFTER ASSEMBLY OF REAR FACADE.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES - TOLERANCES ON:

- 2 PLACE DECIMALS ±
- 3 PLACE DECIMALS ±
- ANGLES ±
- FRACTIONS ±
- MATERIAL -

SIGNATURES: [Blank]

DATE: 4/70

GENERAL ELECTRIC E-LAB INC. SYRACUSE

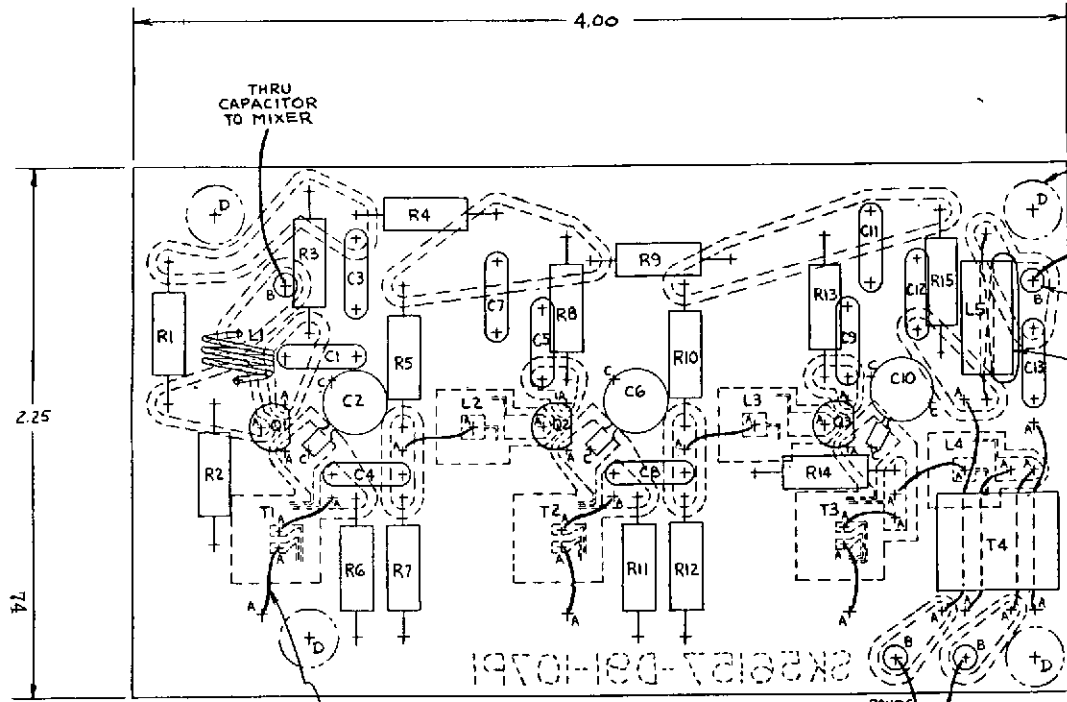
CHASSIS
 12.0 + 2.25 GHZ FM GROUND UNIT

SIZE: D
 CODE (DDT) NO.: 13688
 SCALE: 1 X

SK56157-D91-84

SHEET

ZONE		REVISIONS		DATE	APPROVED
LT	LR	DESCRIPTION			



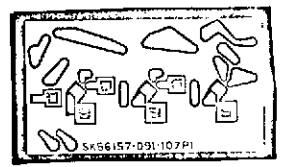
OUTLINE OF .25 DIA MOUNTING SPACER

-20VDC TO OSCILLATOR

STIMPSON SILVER PLATED EYELET #A-2181-GS-2-4 4 PLACES AT B

.025 DIA WIRE WOUND ON FERRITE CORE FERROXCUBE CORP. CAT # 5633031/4B

PRINTED CIRCUIT BOARD MAT'L - 1/16 THK EPOXY GLASS WITH 2 OZ COPPER ONE SIDE



DRILL TABLE		
SYMBOL	DESCRIPTION	QTY
	ALL UNLABELED HOLES	54
	.040 DIA	35
A	.025 DIA	4
B	.063 DIA	2
C	.081 DIA	7
D	.140 DIA	4

- (G1) NOTES:
1. PRIOR TO COMPONENT ASSEMBLY APPLY ELECTRO-LESS HOT TIN TO ALL COPPER SURFACES OF PRINTED BOARD
 2. BOND BALUN TA AND COIL L5 TO BOARD WITH RTV OR EQUIV.
 3. DO NOT ASSEMBLE ANY FLYING LEADS.
 4. VARIABLE CAPACITORS C2 & C6 - BEND UNUSED LEAD OUT OF WAY.
 5. SERIALIZE BOARDS BY RUBBER STAMPING 'SFM 1' THRU 'SFM 10'.

JUMPER WIRE 3 PLACES

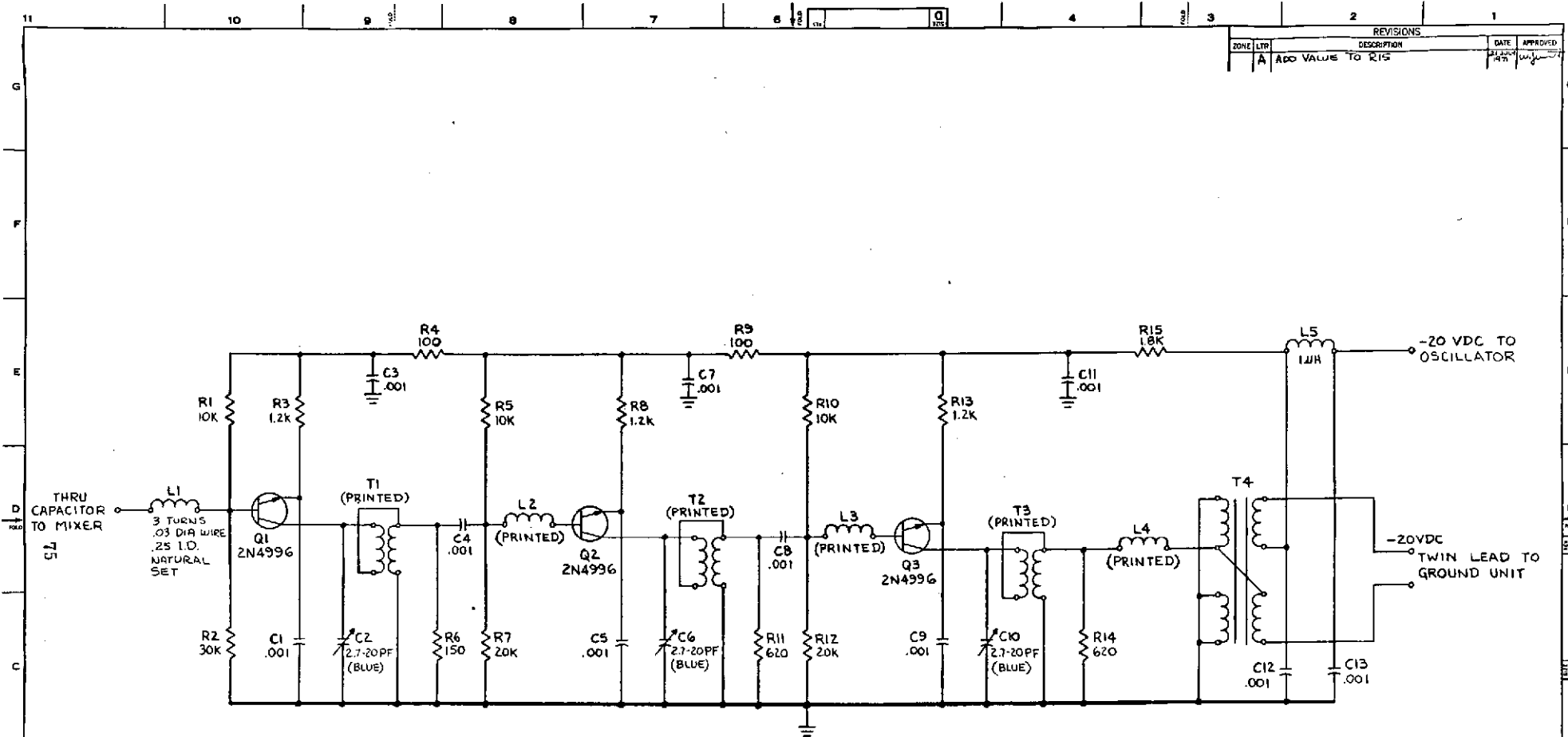
TO TERMINAL STRIP THEN THRU TWIN LEAD TO GROUND UNIT

1970-198-716822

FOR SCHEMATIC DIAG SEE SK56157-D91-108

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES - TOLERANCES ON: 3 PLACE DECIMALS ± .02 ALL SURF. ANGLES ± FRACTIONS ± MATERIAL-	SIGNATURES		GENERAL ELECTRIC E-LAB STACUOE
	DESIGN	DATE	
	ISSUED	BY	
	DATE	BY	
IF PREAMPLIFIER (2.25 GHz FM ANTENNA UNIT)			SIZE CODE IDENT NO D 13688 SK56157-D91-107
SCALE 4X			SHEET

REVISIONS				DATE	APPROVED
ZONE	LTR	DESCRIPTION			
A		ADD VALUE TO R15			

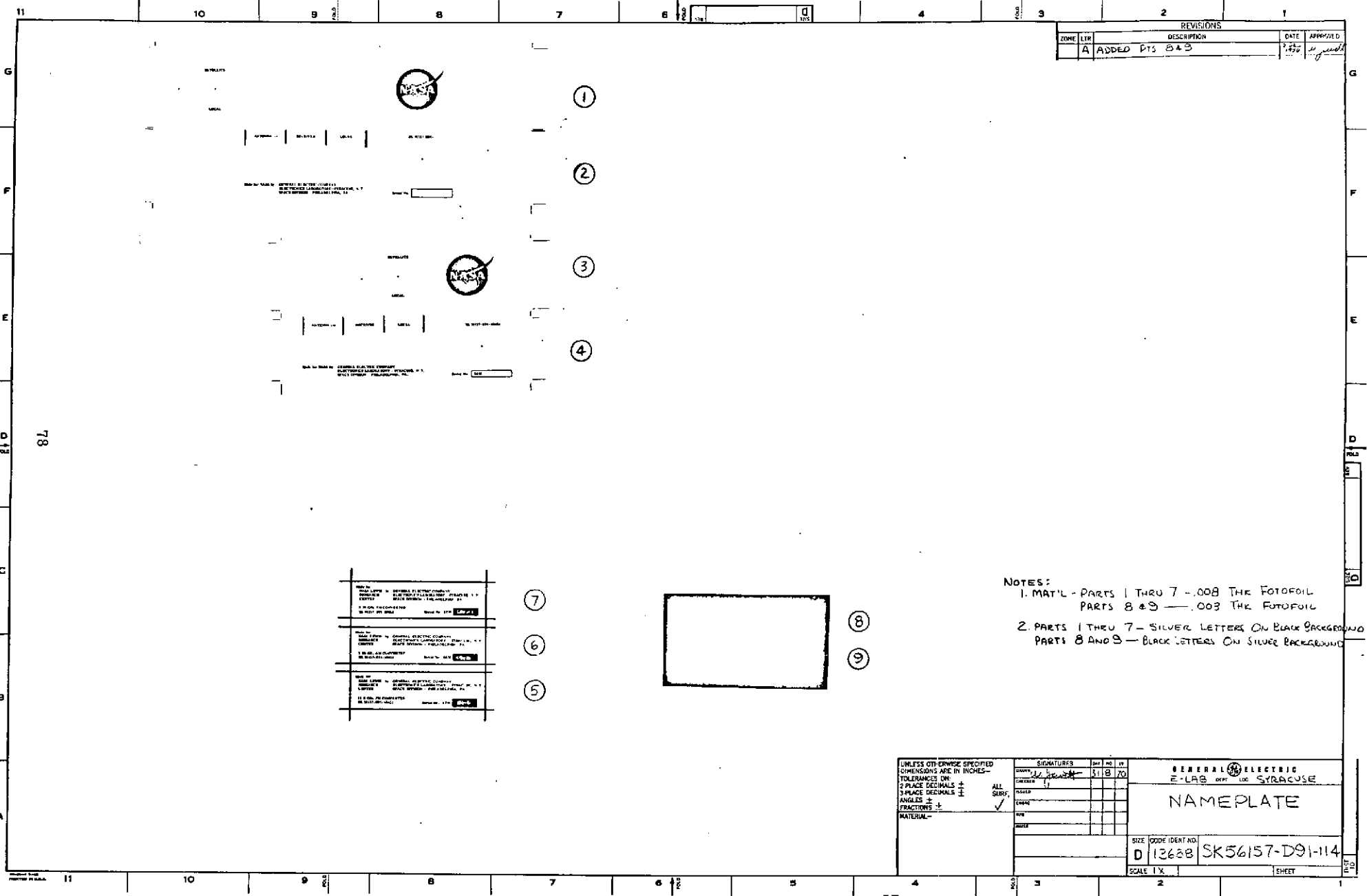


NOTES:
 1. ALL RESISTOR VALUES ARE IN OHMS,
 TOLERANCE $\pm 10\%$, $\frac{1}{2}$ WATT EXCEPT AS NOTED.
 2. ALL CAPACITOR VALUES ARE IN MICRO-FARADS
 EXCEPT AS NOTED.

FOR ASSY DWG. SEE SKS6157-D91-107

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES— TOLERANCES ON: 2 PLACE DECIMALS \pm ALL SURF. 3 PLACE DECIMALS \pm ANGLES \pm FRACTIONS \pm MATERIAL—	SIGNATURES		DATE	BY	NO.
	<i>[Signature]</i>		19	6	70
	NAME				
	DATE		7	12	71
MATERIAL					
GENERAL ELECTRIC E-LAB DEPT. 100 SYRACUSE			SCHEMATIC DIAGRAM		
IF PREAMPLIFIER (2.25 GHz FM ANTENNA UNIT)			SIZE CODE IDENT NO. D 13688 SKS6157-D91-108		
SCALE			SHEET		

LIST USED
 L5
 R15
 Q3
 C13
 T4



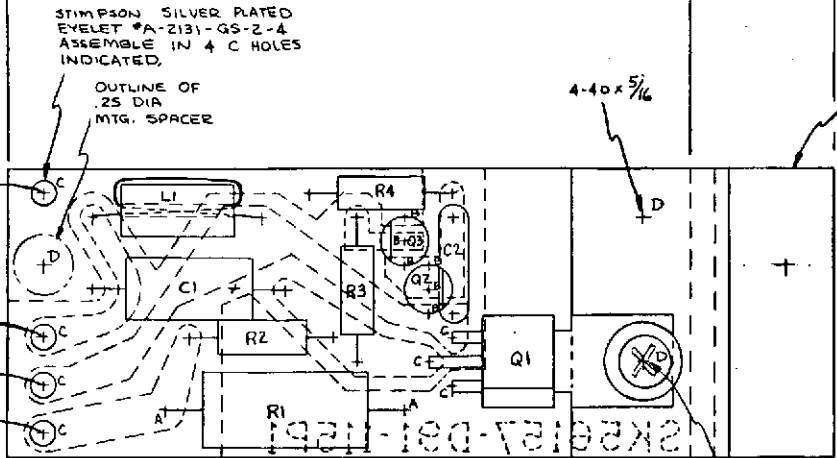
REVISIONS			
ZONE	LR	DESCRIPTION	DATE APPROVED
A		ADDED PTS 8 & 9	3/70 <i>W. J. Smith</i>

<small> MADE BY NAME: JOHN W. GIBSON POSITION: SENIOR PLASMA PHYSICIST DIVISION: PLASMA PHYSICS PROJECT: SK-56157-D91-114 </small>	<small> DRAWN BY NAME: J. W. GIBSON POSITION: SENIOR PLASMA PHYSICIST DIVISION: PLASMA PHYSICS PROJECT: SK-56157-D91-114 </small>
<small> MADE BY NAME: JOHN W. GIBSON POSITION: SENIOR PLASMA PHYSICIST DIVISION: PLASMA PHYSICS PROJECT: SK-56157-D91-114 </small>	<small> DRAWN BY NAME: J. W. GIBSON POSITION: SENIOR PLASMA PHYSICIST DIVISION: PLASMA PHYSICS PROJECT: SK-56157-D91-114 </small>
<small> MADE BY NAME: JOHN W. GIBSON POSITION: SENIOR PLASMA PHYSICIST DIVISION: PLASMA PHYSICS PROJECT: SK-56157-D91-114 </small>	<small> DRAWN BY NAME: J. W. GIBSON POSITION: SENIOR PLASMA PHYSICIST DIVISION: PLASMA PHYSICS PROJECT: SK-56157-D91-114 </small>

NOTES:
 1. MAT'L - PARTS 1 THRU 7 - .008 THK FOTOFOL
 PARTS 8 & 9 - .003 THK FOTOFOL
 2. PARTS 1 THRU 7 - SILVER LETTERS ON BLACK BACKGROUND
 PARTS 8 AND 9 - BLACK LETTERS ON SILVER BACKGROUND

<small> UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES - TOLERANCES ON: 3 PLACE DECIMALS ± 2 PLACE DECIMALS ± ANGLES ± FRACTIONS ± MATERIAL - </small>	SIGNATURES		<small> GENERAL ELECTRIC E-LAB DEPT LOC SYRACUSE NAMEPLATE </small>	
	<small> DRAWN CHECKED DESIGNED INSP DATE </small>	<small> BY NO IN </small>		<small> 3/18/70 </small>
	<small> SCALE 1 X </small>			
	<small> SHEET </small>			
<small> SIZE CODE IDENT NO D 13628 SK56157-D91-114 </small>				

REVISIONS		DATE	APPROVED
ZONE	LTN		
A	ADDED CZ	21 JUL 1971	W. L. ...

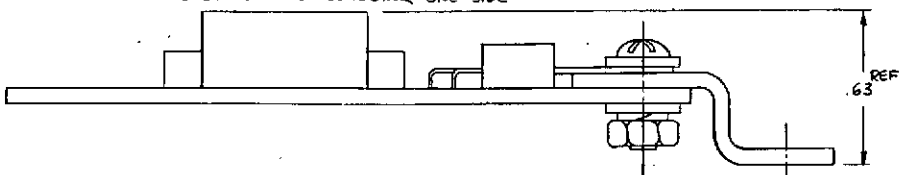


② HEAT SINK BRACKET
SK56157-B91-116PI

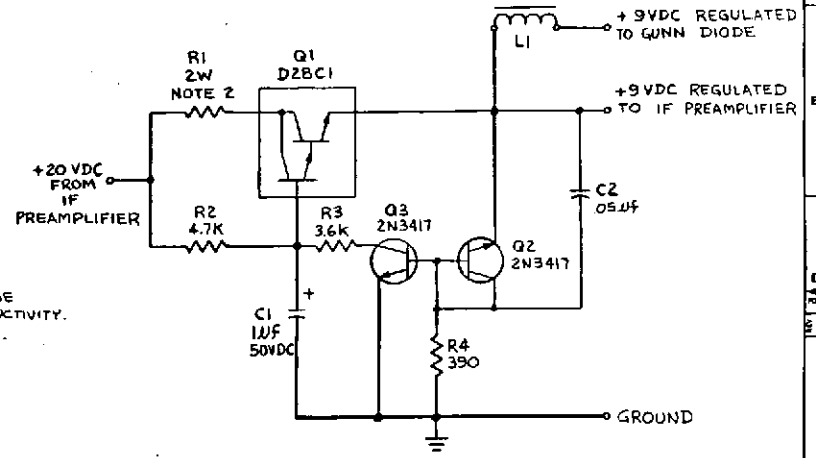
79
80

① PRINTED CIRCUIT BOARD
MAYL-1/16 THK PAPER BASE PHENOLIC
NEMA GRADE XXXP WITH
2 OZ COPPER CLADDING ONE SIDE

4-40 x 3/8 LONG SCREW,
NUT, WASHER & 2 FLAT
WASHERS MOUNTING Q1
AS SHOWN,
COAT WITH SILICONE GREASE
FOR GOOD THERMAL CONDUCTIVITY.



1/2 TURNS OF .025 DIA WIRE
WOUND THRU 2 HOLES
OF FERRITE CORE
FERROXUBE CORP.
CAT. # 5639031/4B



SCHEMATIC NOTES

1. ALL RESISTOR VALUES IN OHMS, 1/2 WATTS, TOL. ± 15% EXCEPT AS NOTED.
2. VALUE OF R1 DEPENDENT UPON GUNN DIODE.

DRILL TABLE		
SYMBOL	DESCRIPTION	QTY
	ALL UNLABELED HOLES .040 DIA	12
A	.055 DIA	2
B	.025 DIA	6
C	.063 DIA	7
D	.140 DIA	3

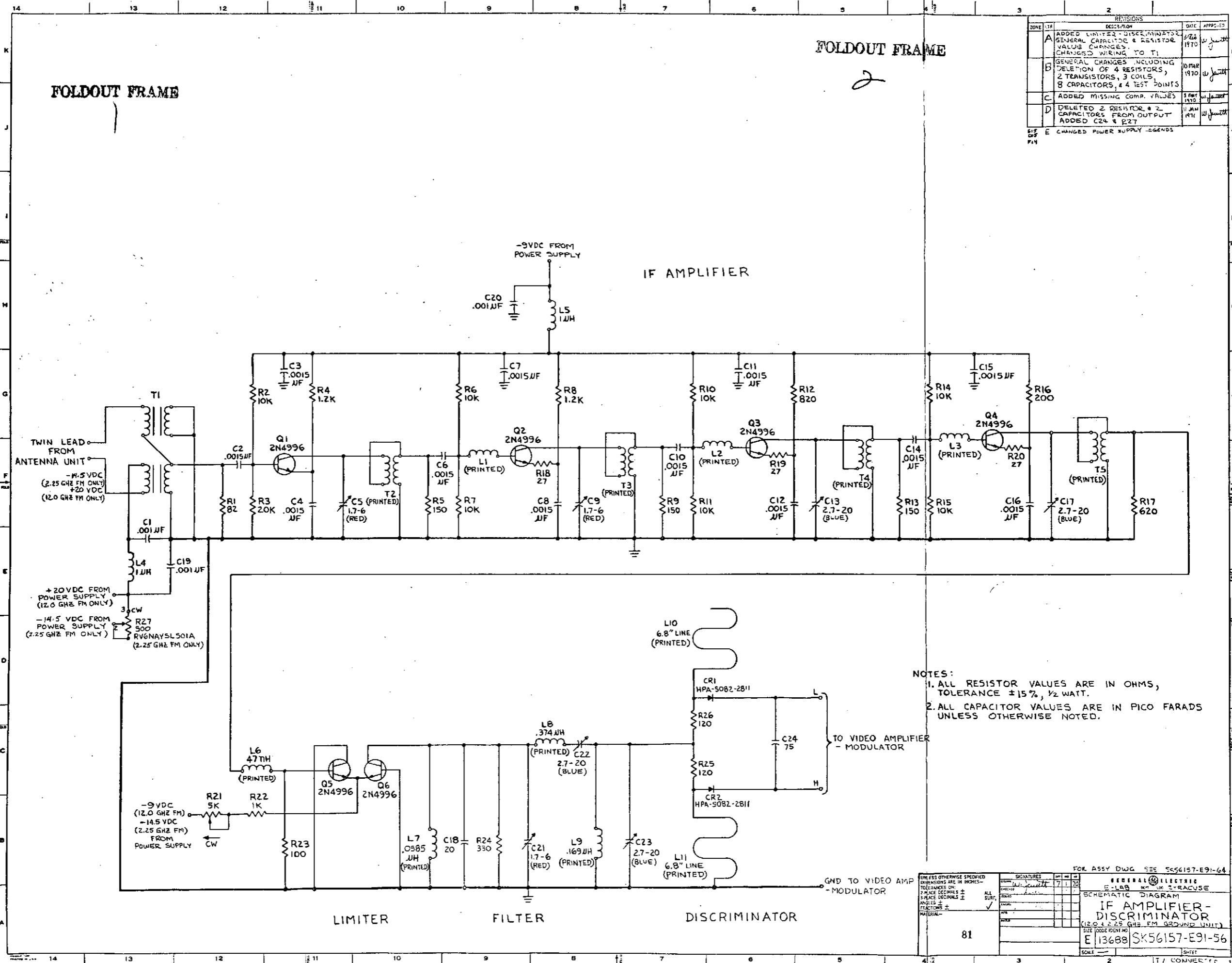
- ① NOTES:
1. PRIOR TO COMPONENT ASSEMBLY APPLY ELECTROLYSIS HOT TIN TO ALL COPPER SURFACES OF PRINTED BOARD. SHIPLEY COUSIT LT26 TIN OR EQUIV.
 2. BOND COIL L1 TO BOARD WITH RTV OR EQUIV.
 3. DO NOT ASSEMBLE ANY FLYING LEADS.
 4. SERIALIZE BOARDS BY RUBBER STAMPING "XFM 1" THRU "XFM 10".



UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES—
TOLERANCES ON:
3 PLACE DECIMALS ± .02 ALL SURF.
2 PLACE DECIMALS ±
ANGLES ±
FRACTIONS ±
MATERIAL—

SIGNATURES		DATE	NO.	REV.
DESIGNED	W. J. ...	11	9	70
CHECKED				
DATE				
NO.				
REV.				

GENERAL ELECTRIC E-LAB or SYRACUSE	
VOLTAGE REGULATOR, GUNN OSCILLATOR, (12.0 GHZ FM ANTENNA UNIT)	
SIZE CODE IDENT NO.	D 13688
SCALE	4 X
SHEET	



FOLDOUT FRAME

FOLDOUT FRAME

IF AMPLIFIER

LIMITER

FILTER

DISCRIMINATOR

ZONE	DATE	DESCRIPTION	APPROVED
A	3/26/70	ADDED LIMITED DISCRIMINATOR GENERAL CAPACITOR & RESISTOR VALUES CHANGES. CHANGED WIRING TO T1	W. J. J.
B	10 MAR 1970	GENERAL CHANGES INCLUDING DELETION OF 4 RESISTORS, 2 TRANSISTORS, 3 COILS, 8 CAPACITORS, & 4 TEST POINTS	W. J. J.
C	5 APR 1970	ADDED MISSING COMP. VALUES	W. J. J.
D	11 JAN 1971	DELETED 2 RESISTOR & 2 CAPACITORS FROM OUTPUT ADDED C24 & R27	W. J. J.
E		CHANGED POWER SUPPLY LEGENDS	

- NOTES:
1. ALL RESISTOR VALUES ARE IN OHMS, TOLERANCE $\pm 15\%$, $\frac{1}{2}$ WATT.
 2. ALL CAPACITOR VALUES ARE IN PICO FARADS UNLESS OTHERWISE NOTED.

FOR ASSY DWG SEE SC56157-E91-64

DESIGNED BY	W. J. J.	DATE	7/1/70
CHECKED BY			
STATUS	ALL		
SCALE			
MATERIAL			

GENERAL ELECTRIC
E-1368 SK56157-E91-56
IF AMPLIFIER-DISCRIMINATOR
(12.0 & 2.25 GHz FM GROUND UNIT)
SIZE (ODD POINT)
E 13688 SK56157-E91-56
SCALE
SHEET

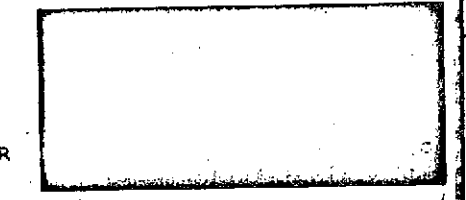
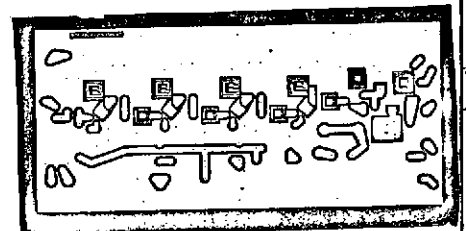
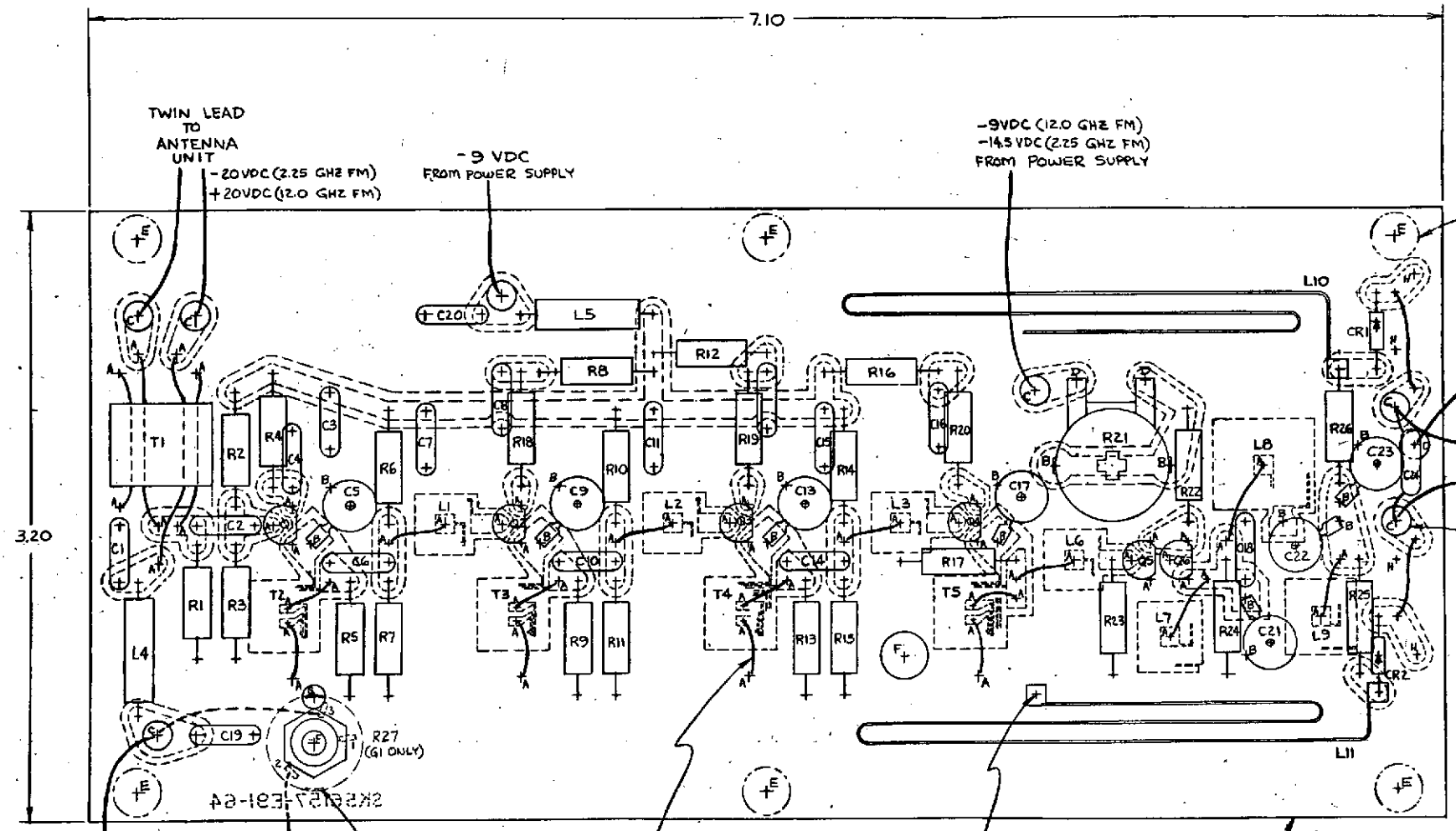
81

T/ CONNECT

FOLDOUT FRAME

FOLDOUT FRAME

ZONE	DESCRIPTION	DATE	APPROVED
A	GENERAL UPDATING FOR ASSY INCLUDING REMOVAL OF 4 MTR POSTS & ADDITION OF MTR CONN. & ADJUSTMENT HOLE	5 MAY 1970	W. J. J. J.
B	DELETED 2 CAPS & 2 RESISTORS FROM OUTPUT. ADDED POT & C24 & 2 JUMPERS	11 JAN 1971	W. J. J. J.

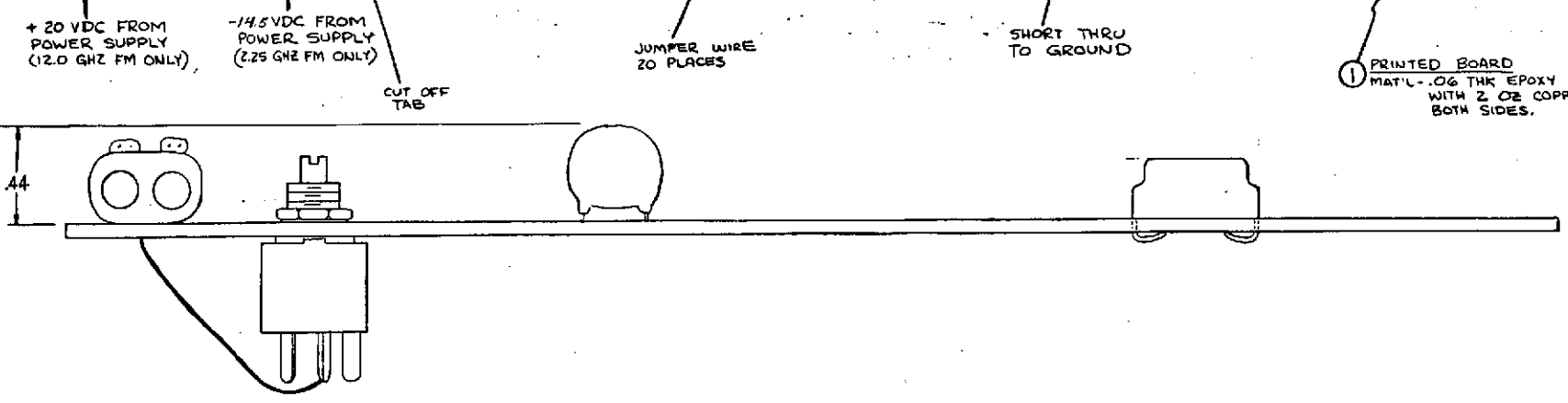


OUTLINE OF .25 DIA MTR. SPACERS

GROUND TO VIDEO AMPLIFIER-MODULATOR

L TO VIDEO AMPLIFIER-MODULATOR

JIMPSON SILVER PLATED EYELET #A-2131-45-2-4 8 PLACES AT 'C' HOLES



SYMBOL	DESCRIPTION	QTY
	ALL UNLABELED HOLES .040 DIA	94
A	.025 DIA	56
B	.081 DIA	16
C	.063 DIA	8
D	.059 DIA	2
E	.140 DIA	6
F	.250 DIA	2
G	.110 DIA	1
H	NOT USED DO NOT DRILL	4

- 2.25 GHZ FM SYSTEM
- (G1) NOTES:
- PRIOR TO COMPONENT ASSEMBLY APPLY ELECTROLYSIS HOT TIN TO ALL COPPER SURFACES OF PRINTED BOARD. SHIPLEY COPPOSIT LT26 TIN OR EQUIV.
 - VARIABLE CAPACITORS C5, C9, C13, C17, C21, C22 & C23 - BEND UNUSED LEAD OUT OF WAY.
 - DO NOT ASSEMBLE ANY FLYING LEADS.
 - SERIALIZE BOARDS BY RUBBER STAMPING AS APPLICABLE "SFM 1" THRU "SFM 10" AND "XFM 1" THRU "XFM 10".
 - BOND BALUN T1 TO BOARD WITH RTV OR EQUIV.

(G2) 12.0 GHZ FM SYSTEM
SAME AS G1 EXCEPT OMIT R27

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES - TOLERANCES ON SPACING DIMENSIONS REPLACE DIMENSIONS IN PARENTHESES

REV	DATE	BY	CHKD
1	3/27/70	W. J. J. J.	W. J. J. J.

REGINA ELECTRIC E-LAB BY SYRACUSE

IF AMPLIFIER - DISCRIMINATOR
(12.0 & 2.25 GHZ FM GROUND UNIT)

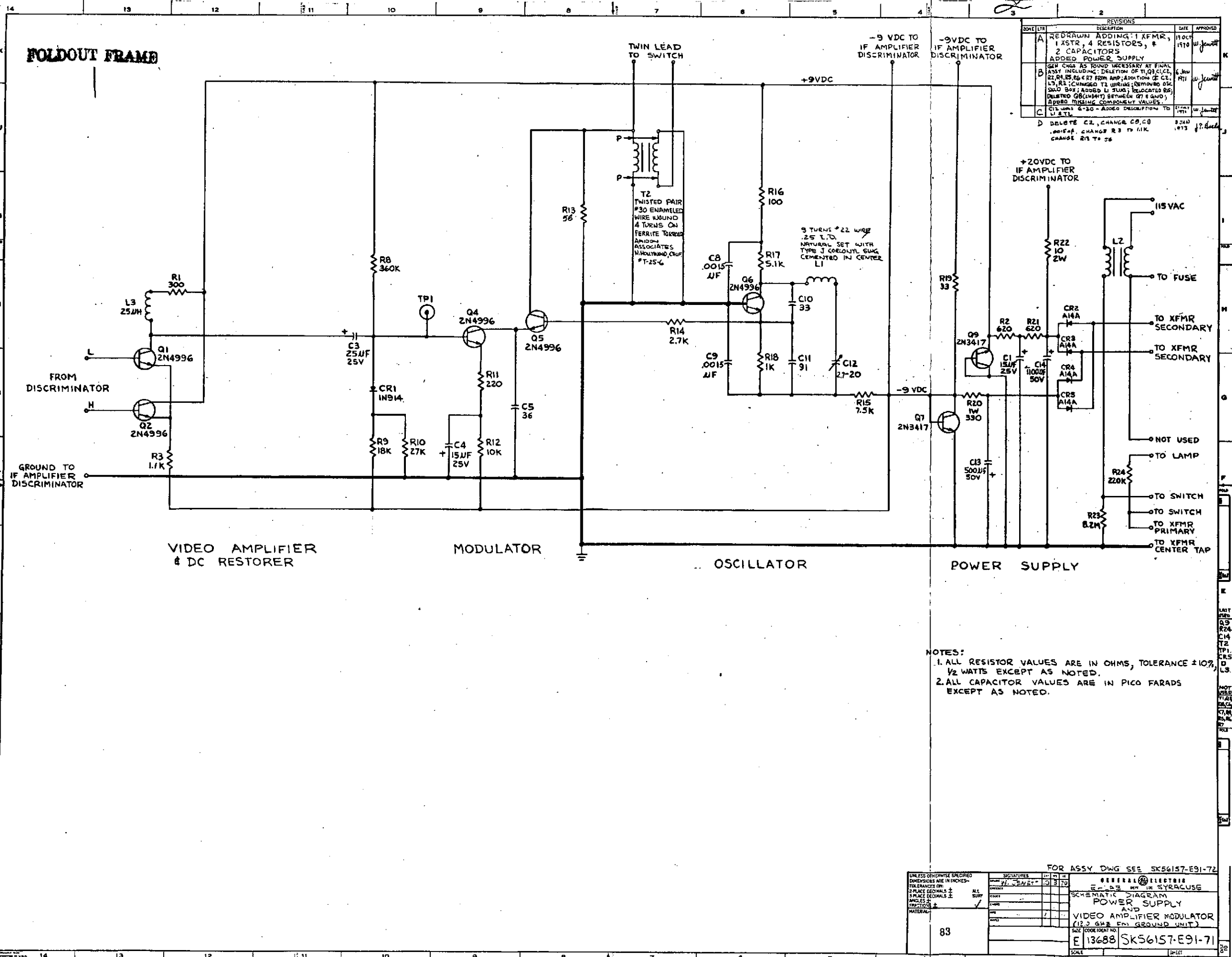
SIZE CODE IDENT NO. E 13688 SK56157-E91-64

SCALE 4X

82

FOLDOUT FRAME

FOLDOUT FRAME



REV	DATE	DESCRIPTION	APPROVED
A	11 OCT 1970	REDRAWN ADDING: 1 XFMR, 1 ASTR, 4 RESISTORS, & 2 CAPACITORS ADDED POWER SUPPLY	W. Jewett
B	6 JAN 1971	GEN CHG AS FOUND NECESSARY AT FINAL ASSY INCLUDING: DELETION OF T1, Q3, C12, C2, R4, R5, R6, R7 FROM AMP; ADDITION OF C2, L3, R3; CHANGED T2 WIRING; REMOVED Q2, Q3, Q4; ADDED L1 FLUX; RELOCATED Q5; DELETED Q8 (MOUNT) BETWEEN Q7 & Q9; ADDED MISSING COMPONENT VALUES.	W. Jewett
C	11 FEB 1971	C11 VALUE 6-20 - ADDED DESCRIPTION TO L1 & T2.	W. Jewett
D	8 JAN 1973	DELETE C2, CHANGE C9, C8 .0015F, CHANGE R3 TO 11K, CHANGE R13 TO 56	J. H. Smith

NOTES:
 1. ALL RESISTOR VALUES ARE IN OHMS, TOLERANCE ±10%, 1/2 WATTS EXCEPT AS NOTED.
 2. ALL CAPACITOR VALUES ARE IN PICO FARADS EXCEPT AS NOTED.

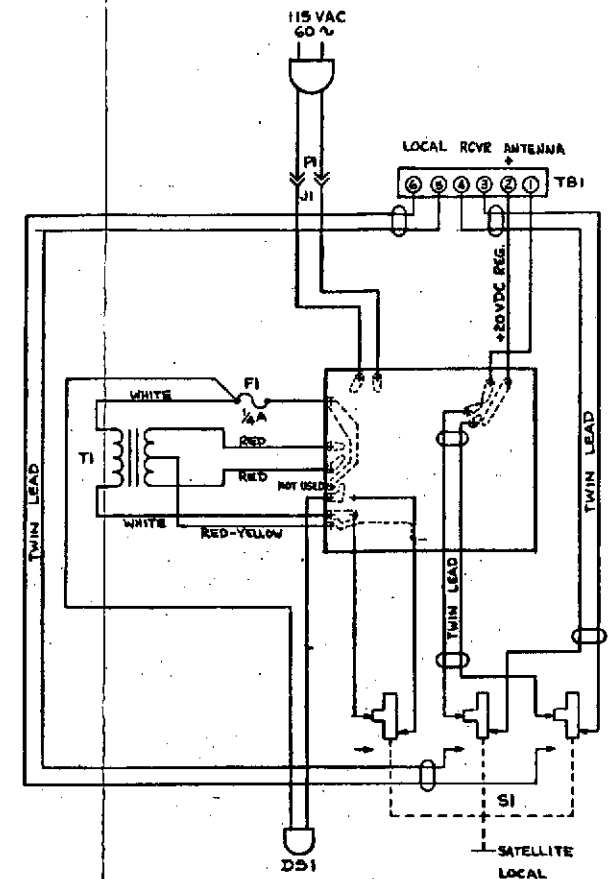
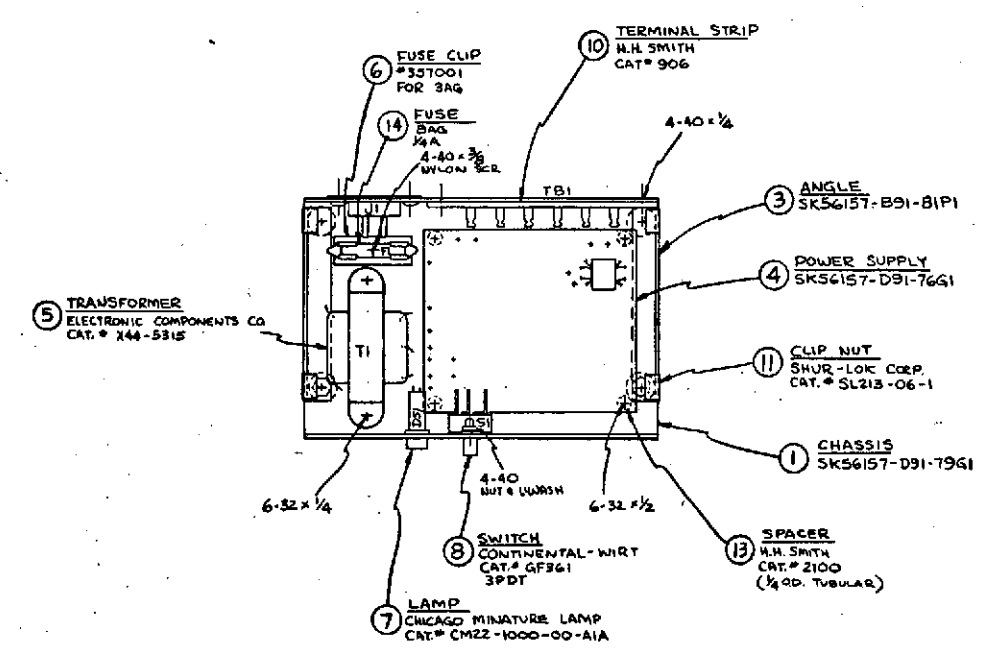
FOR ASSY DWG SEE SK56157-E91-72

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES -	TOLERANCES ON:	2 PLACE DECIMALS ±	3 PLACE DECIMALS ±	ANGLES ±	SPACINGS ±	MATERIAL:
DATE	BY	CHKD	APP'D	REV	QTY	UNIT
83	W. JEWETT					

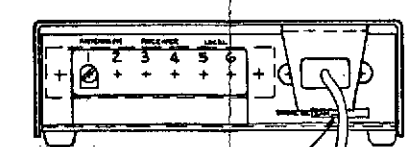
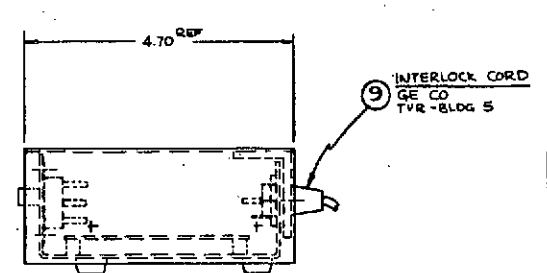
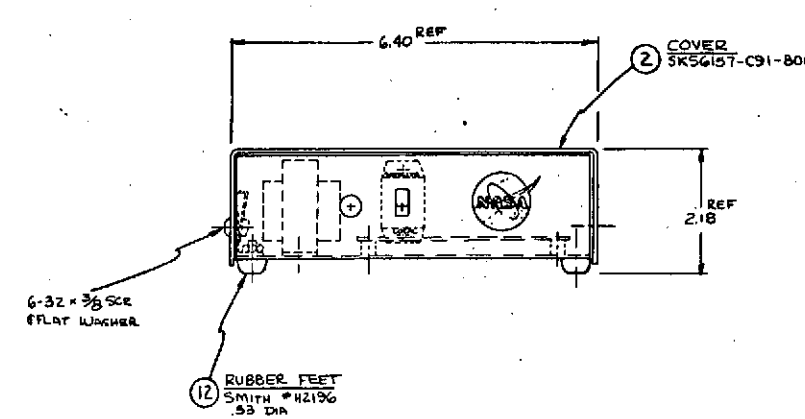
GENERAL ELECTRIC
 SCHEMATIC DIAGRAM
 POWER SUPPLY
 AND
 VIDEO AMPLIFIER MODULATOR
 (12.2 GHz FM GROUND UNIT)
 E 13688 SK56157-E91-71

FOLDOUT FRAME

FOLDOUT FRAME
2



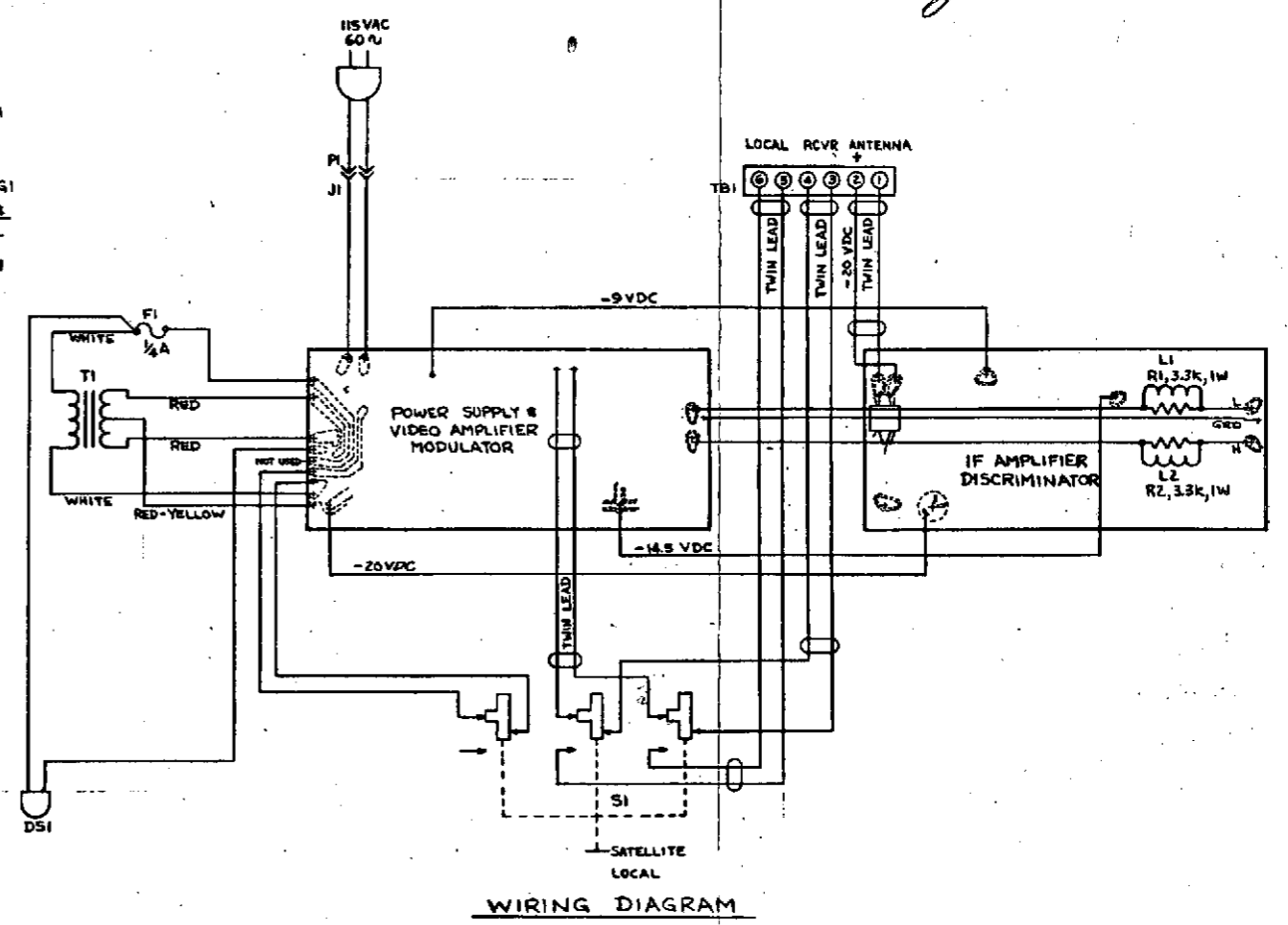
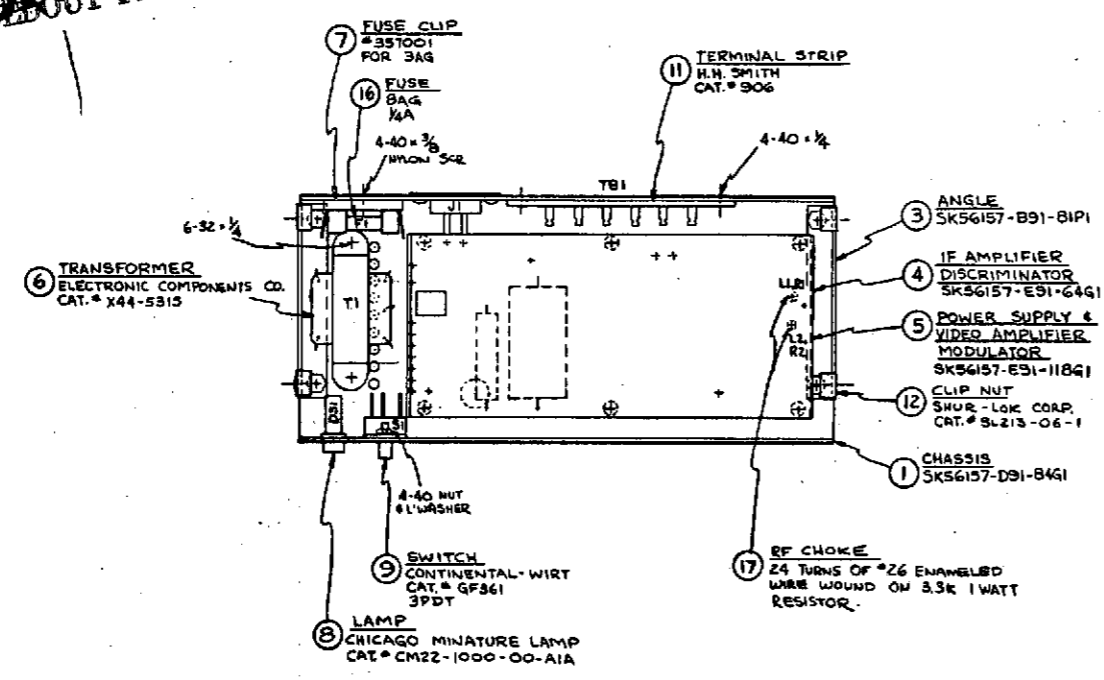
WIRING DIAGRAM



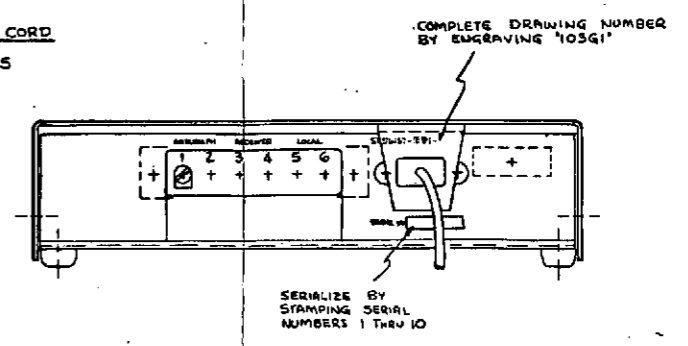
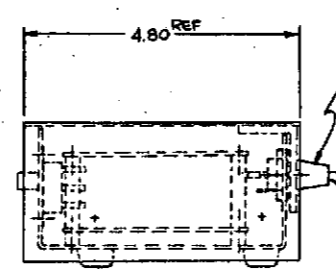
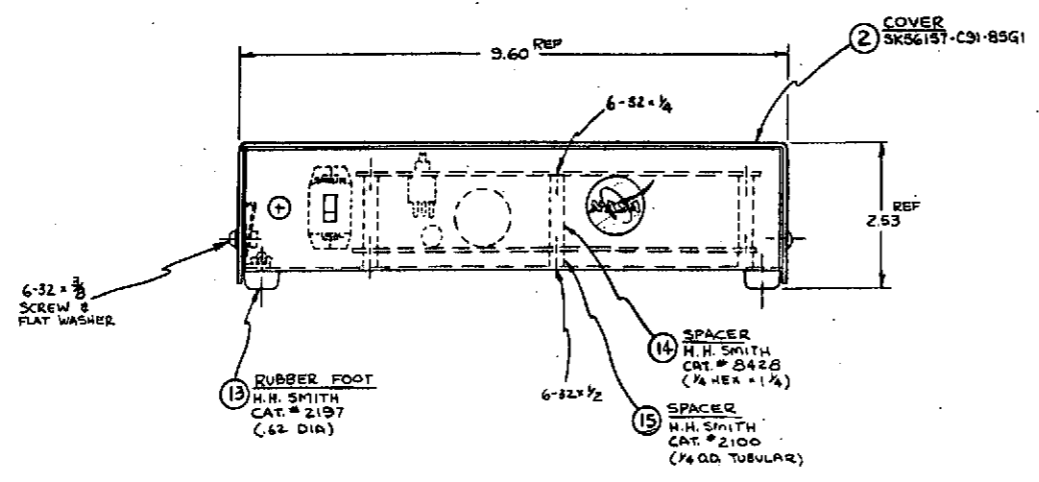
UNLESS OTHERWISE SPECIFIED		SIGNATURES		GENERAL ELECTRIC	
DIMENSIONS ARE IN INCHES - TOLERANCES ON:		DATE	BY	E-LAB DEPT. OF SYRACUSE	
7 PLACE DECIMALS ±	ALL DIMENSIONS	2/3/70	[Signature]		
3 PLACE DECIMALS ±	ALL DIMENSIONS				
ANGLES ±	ALL DIMENSIONS				
FRACTIONS ±	ALL DIMENSIONS				
MATERIAL	ALL DIMENSIONS				
87				2.25 GHZ AM GROUND UNIT ASSY	
				E 13698 SK56157-E91-101	
				SCALE 1X	

REVISIONS			
ZONE	REV	DESCRIPTION	DATE
A	1	ADDED L1, L2, R1 & R2 & FUSE VALUE	5 JAN 57
		DELETED PUT FROM -10VDC LINE	71

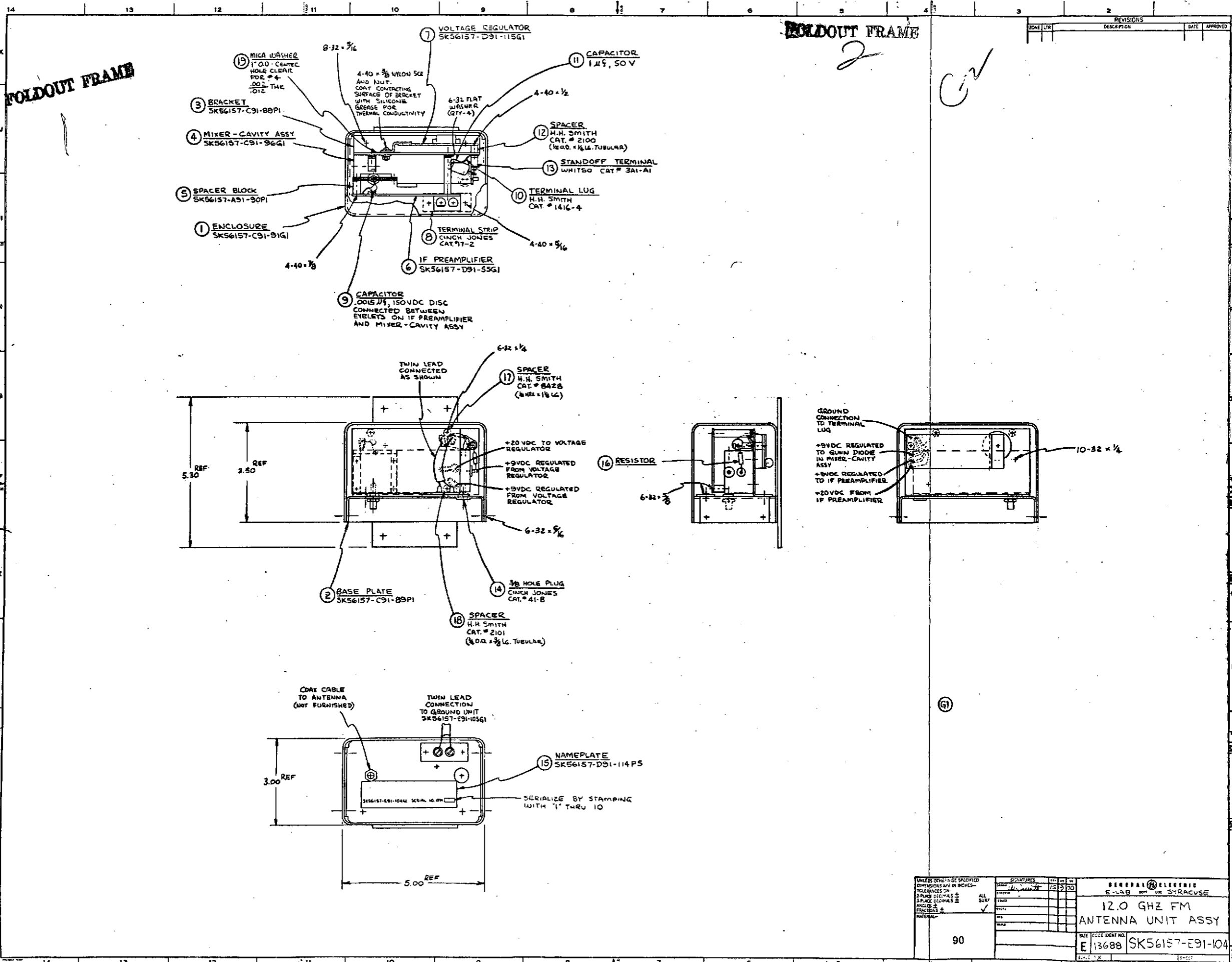
WITHOUT FRAMES
WITHOUT FRAMES



WIRING DIAGRAM



UNLESS OTHERWISE SPECIFIED		SIGNATURES		GENERAL ELECTRIC	
DIMENSIONS ARE IN INCHES - FRACTIONS OR DECIMALS	ALL SUP	DATE	BY	E-LAB	SYRACUSE
SPACER DECIMALS ±					
ANGLE & TOLERANCES ±					
PARTS					
89					
				2.25 GHZ FM GROUND UNIT ASSY	
				E 13633 SK56157-E91-103	
				SCALE 1:1 SHEET	



FOLDOUT FRAME

FOLDOUT FRAME

REVISIONS		DATE	APPROVED
ZONE	LTR		

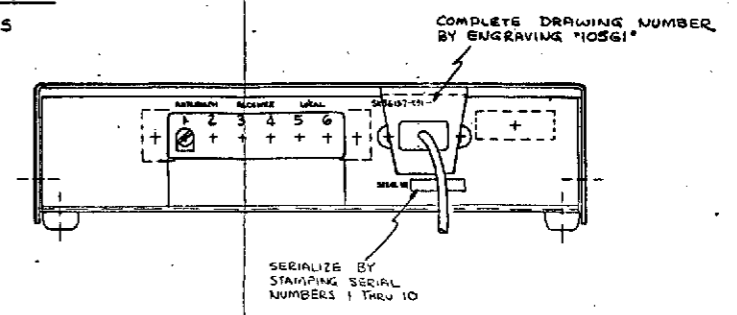
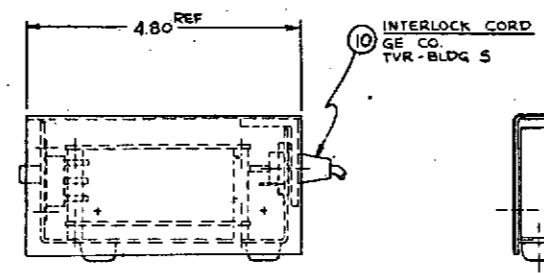
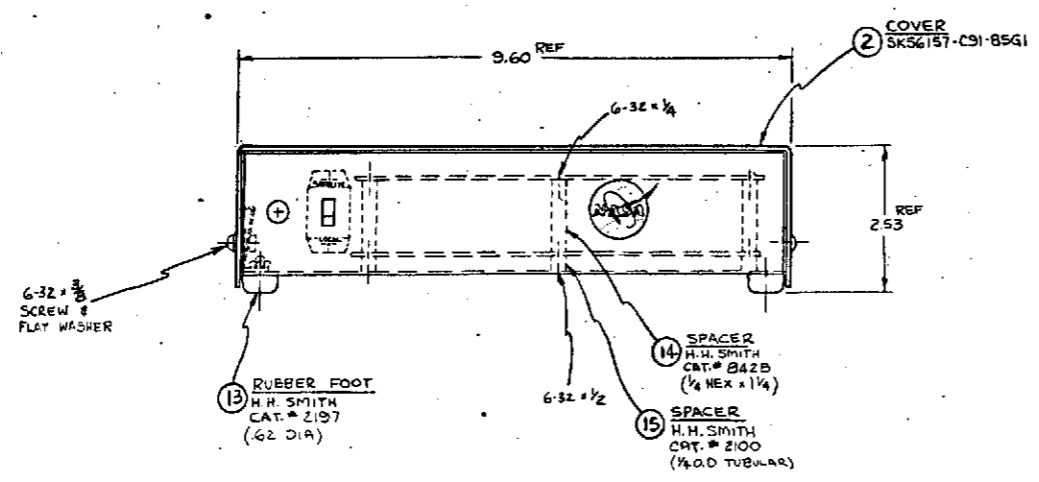
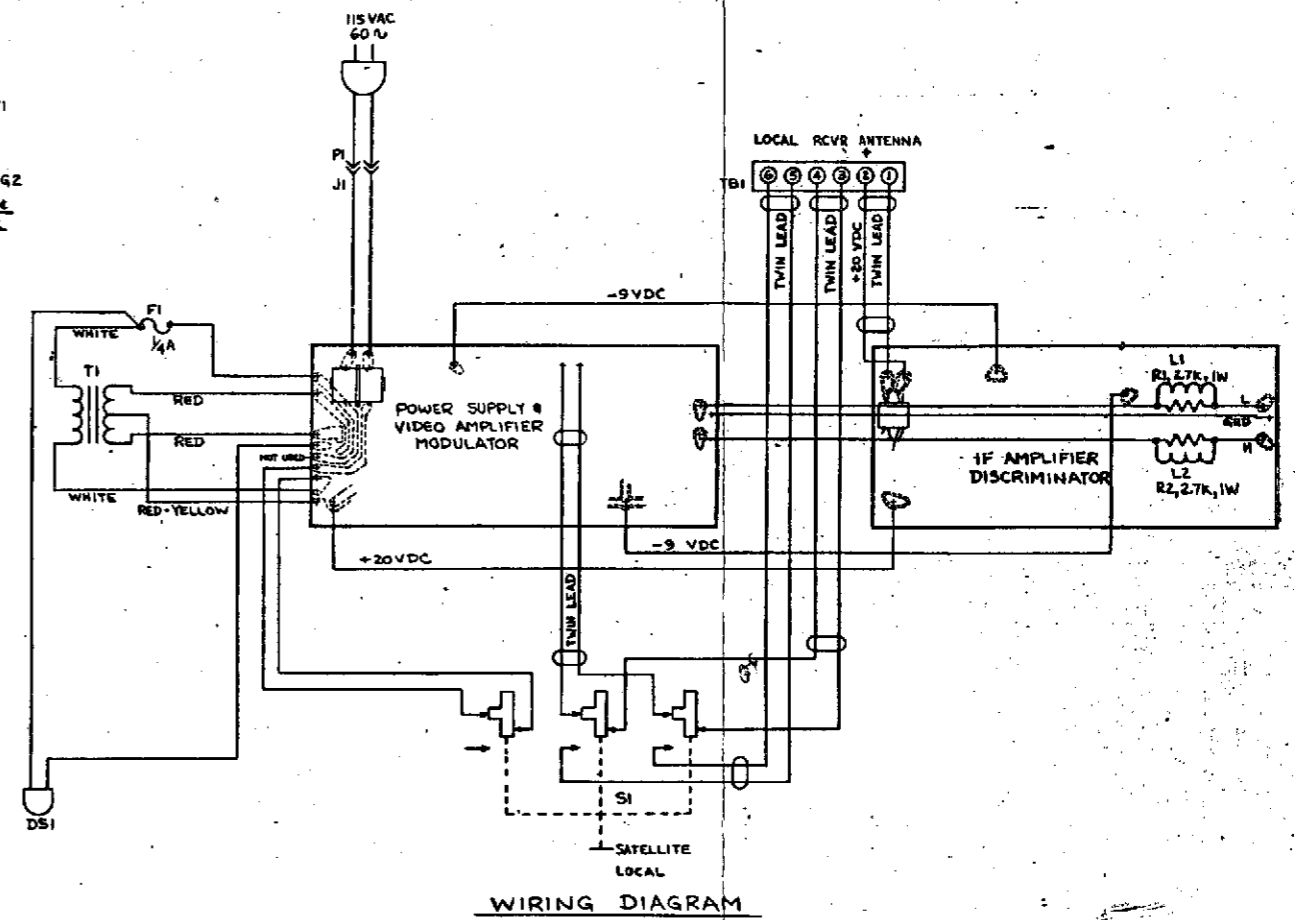
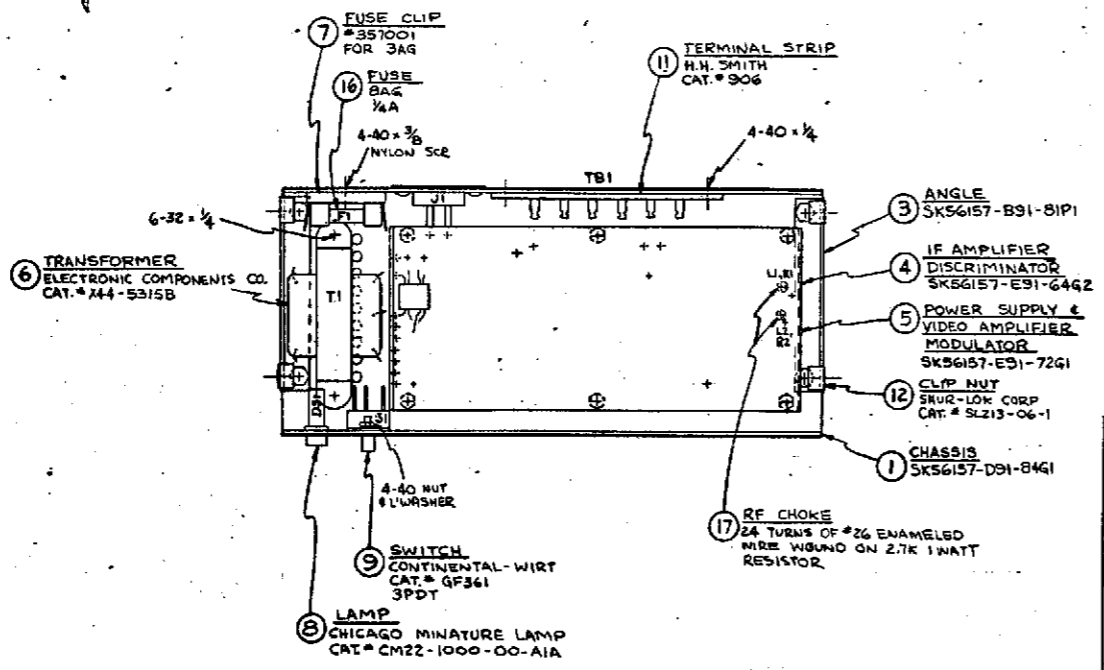
GW

G1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES— TOLERANCES ON DIMENSIONS 3 PLACE DECIMALS ± 2 PLACE DECIMALS ± ANGLES & FRACTIONS ±		SIGNATURES		GENERAL ELECTRIC E-LSB Syracuse	
DESIGNED	DATE	BY	CHKD	DATE	
DRAWN					
CHECKED					
APPROVED					
90		E 13688		SK56157-E91-104	
SIZE		ECCO IDENT NO.		SCALE	

FOLDOUT FRAME

FOLDOUT FRAME
2



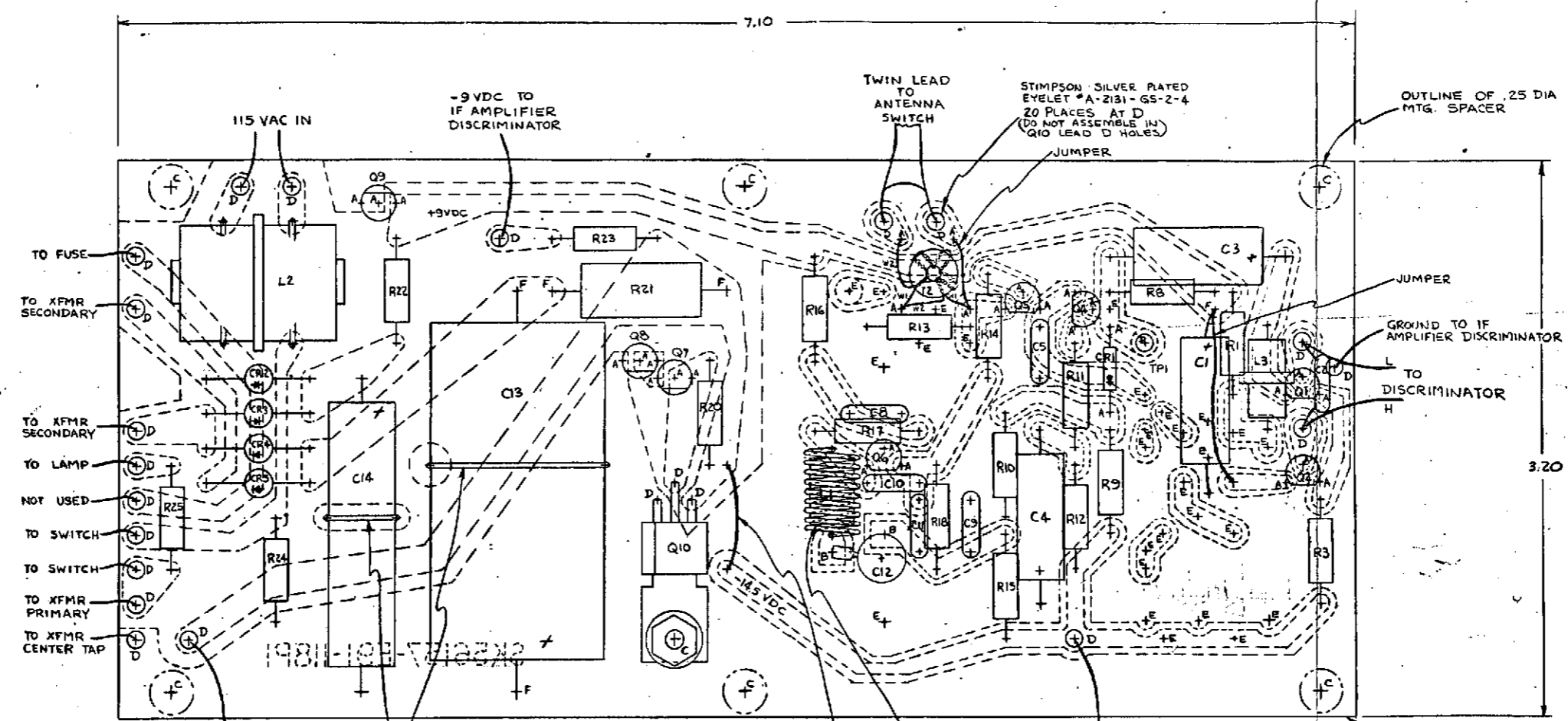
91	13688	SK56157-E91-125
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GENERAL ELECTRIC E-LAB SYRACUSE
12.0 GHZ FM GROUND UNIT ASSY

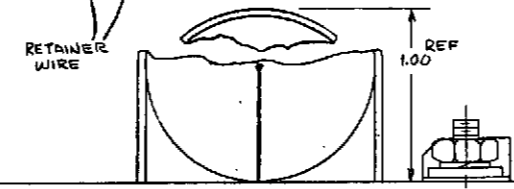
FOLDOUT FRAME

FOLDOUT FRAME

REV.	DESCRIPTION	DATE	APPROVED
A	3. SERIAL LEADS TO BRIDGE WITH SILENTIC		
B	DELETE C2		



TO FUSE
TO XFMR SECONDARY
TO XFMR SECONDARY
TO LAMP
NOT USED
TO SWITCH
TO SWITCH
TO XFMR PRIMARY
TO XFMR CENTER TAP

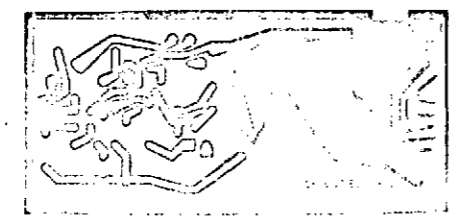


4-40 x 3/8 LONG SCREW, NUT, WASHER & 2 FLAT WASHERS MOUNTING Q10 AS SHOWN. COAT WITH SILICONE GREASE FOR GOOD THERMAL CONDUCTIVITY.

SYMBOL	DESCRIPTION	QTY
	ALL UNLABELED HOLES .040 DIA	75
A	.025 DIA	30
B	.081 DIA	2
C	.140 DIA	7
D	.063 DIA	23
E	UNUSED-DO NOT DRILL	23
F	.059 DIA	5

PRINTED CIRCUIT BOARD
MAYL - 1/16 THK EPOXY GLASS WITH 2 OZ COPPER CLADDING ONE SIDE

- NOTES:
1. PRIOR TO COMPONENT ASSEMBLY APPLY ELECTROLYSIS HOT TIN TO ALL COPPER SURFACES OF PRINTED CIRCUIT BOARD. SHIPLEY CUPOSIT LT26 TIN OR EQUIV.
 2. DO NOT ASSEMBLE ANY FLYING LEADS.
 3. CAPACITOR C12 - CUT OFF UNUSED LEAD.
 4. BOND TRANSFORMER T2 TO BOARD WITH RTV OR EQUIVALENT.
 5. SERIALIZE BOARDS BY RUBBER STAMPING WITH 'SFM 1' THRU 'SFM 10'.



FOR SCHEMATIC DIAG. SEE SK56157-E91H17

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES - TOLERANCES ON: PLACE DECIMALS ± .02 ALL PLACE DECIMALS ± .001 FRACTIONS ± .005	DATE: 11/10/57	REV: 1	BY: [Signature]	CHKD: [Signature]
GENERAL ELECTRIC E-LAB DIV. OF SRAUCLE POWER SUPPLY AND VIDEO AMPLIFIER-MODULATOR (225 MHz FM GROUND UNIT) E 12083 SK56157-E91-118 SHEET 2 OF 2				