

and video is fed to pin 5 of comparator U1. The U1 reference voltage is obtained from a voltage divider that includes potentiometer R113 labeled MONITOR CAL. on the circuit board. R113 sets the reference voltage to a prescribed value for correct operation of the video amplifier.

The output of comparator U1, at pin 6, goes into Q11 and Q12 which act as a sync tip level detector and provides a DC correction signal fed back to the base of Q7 through J2, J8 and R23.

In summary, the sync tip clamp circuit involves a feedback loop from Q7, through Q8, Q9, Q10, U1, Q11 and Q12. From the emitter of Q12, a DC correction voltage is fed back to the base of Q7 to set the sync tip operating point of the emitter of Q10.

The white level clipper exerts its influence on Q10 through a signal path from the Q13 emitter, CR1, to the Q10 emitter. Through this path, Q10 is biased so that it can no longer furnish additional video drive to a diode bridge in the video modulator.

The biasing of Q10 puts a limit on modulation depth and prevents carrier cut-off caused by over modulation and the resulting distortion and sync buzz.

The modulation depth, in the white level clipper circuit, is adjusted by potentiometer R42, a user screwdriver adjustment on the circuit board labeled WHITE CLIP LVL.

The output video amplifier, from the Q10 emitter, drives the video modulator circuit consisting of R68, L19, R69 and diode bridge modulator CR8, CR9, CR10, and CR11. R113, labeled MONITOR CAL. on the circuit board, is factory adjusted to calibrate the diode bridge to generate 87.5% modulation at the standard video input level to the ATM-1600. R113 forms a voltage divider with R112 and thermistor RT1 to pin 3 of operational amplifier U4B.

The R113/R112/RT1 combination sets the reference voltage at the U4B output, Pin 1. This output provides a low impedance drive point for CR9 and CR11. The CR9 and CR11 junction is a fixed voltage point. The video signal is fed to the other side of the diode bridge, at the junction of

CR8 and CR10.

When the voltage at the CR8/CR10 junction is equal to the voltage at the CR9/CR11 junction, the bridge is balanced. The RF drive out of transformer T6 is cancelled out and zero power results, across the two junctions, representing 100% modulation. When the levels at the junctions are different, the bridge is unbalanced allowing the RF drive from T6 to go through the modulator stage and to module pin J1-P, the (VISUAL OUT) terminal. The modulation percentage is proportional to the difference in level between the CR8/CR10 and CR9/CR11 junctions.

Factory adjustment C60 across T6, is an adjustable capacitor used to balance out the static phase error that causes differential phase. C60 is adjusted to minimize differential phase.

Input to the modulation percentage detector is from Q10 emitter (from the output video amplifier). The signal is fed through emitter follower, Q22, to diode detector circuit, CR4, CR5 and CR6. The output of the diodes is a DC voltage proportional to the video drive into Q22.

The output of the diode circuit, CR6, is fed into an operational amplifier, U6B, used to provide a visual indication on the MODULATION % bar graph indicator on the front of the Video Modulator.

Transistor Q17, Crystal Y1, tank circuit inductor L10, feedback inductor L12, and C47 comprise a 45.75 MHz oscillator. The oscillator output goes to buffer amplifier Q18.

The buffer amplifier output, at the Q18 collector, is fed through a low pass filter, L13, C52, and C53, and then into directional taps T3 and T4. The directional taps function and routing are as follows:

**T3, 45.75 MHz in and out.** When SW1, the user EXT/INT switch on the PCB is in the INT position, 45.75 MHz is fed from module pin J1-H to the rear panel connector J7 (IF REF). When SW1 is in the EXT position, the module accepts an external 45.75 MHz source, fed into connector J7 (IF REF).

T4, 45.75 MHz to module Pins J2-3 and J2-C. The feed to the audio module used to lock up the Aural IF generating circuits.

The video modulator carrier drive consists of buffer amplifier Q19 and all components between T4 and T6. The circuit supplies CW visual IF carrier drive to the video modulator.

R100, labeled CARRIER DRIVE on the circuit board, is a factory adjusted variable resistor that adjusts the RF drive level to the modulator. This level is set to a prescribed value to maintain the lowest distortion.

The circuit containing Q20 and Q21 and associated components, including capacitors and inductors leading to the module pin J1-P output, is the modulated visual IF output amplifier.

The modulated output from the diode bridge in the video modulator circuit is fed to differential amplifier Q20 and Q21.

The amplifier output is taken from the collector of Q20 and fed to output level potentiometer R105, a factory adjustment labeled OUTPUT LVL CAL on the circuit board.

R105 is associated with coupling transformer T7 which goes into low pass filter C64, C65, C66, L16 and L17. The low pass filter output goes to module pin J1-P which is connected to rear panel J11 (VISUAL OUT). R105 is adjusted to obtain a +40 dBmV output.

Q40 amplifies visual IF, Q42 amplifies aural IF, and with jumper J10 pin 2-3, visual and aural IF signals are fed through directional tap transformer T10. T10 adds the aural IF to the visual IF before the SAW filter, FL1. The combination of components in the Q40 emitter circuit helps to flatten the response over a 40-47 MHz bandwidth.

The J10 jumper is used to add the aural signal to the visual IF signal as follows: J10 pin 2-3 connection adds the aural signal to the visual IF before the SAW filter. A J10 pin 1-2 connection adds the aural signal after the SAW filter. In

some applications, the SAW filter bandpass is too narrow to allow passage of the aural signal; then the J10 pin 2-3 jumper is removed and J10 pin 1-2 is used.

Transistor Q14 forms an IF amplifier that compensates for SAW filter losses. Q14 also forms a buffer between the SAW filter and the LC filter in the Q14 collector circuit. The trimmer potentiometer, R176 allows a small adjustment in gain to maintain unity gain throughout the module amplifier circuits.

The LC filter, L36, L37, C119, C120, C121, C122, and C123, compensates for the SAW filter's slope of the passband response. The pi pad, R183, R184, and R185 helps isolate any perturbations caused by the composite IF outputs affecting the LC filter.

The transformer T5 forms a 3 dB signal splitter to drive U20 and U21. These amplifiers boost the signal to a +40 dBmV output at pins J1-15 and J1-16

At pin J1-K aural IF input, the pi pad R189, R190, and R191 insure a good return loss and isolates the broadband aural IF amplifier Q42.

Following Q42 is a electronic attenuator circuit consisting of C138, C139, CR20, CR21, L41, R197 through R205.

R205 is the AURAL CARRIER front panel adjustment for setting the level of the aural IF carrier referenced to the visual IF carrier.

On the rear panel, J16 monitors the presence of video on J5, VIDEO IN. Output from J16 is positive logic TTL. Output is high with video input (+5 V through 1k ohm source) with an internal pullup resistor. Output is low with no video input (0.4 V maximum). Resistive loads down to zero ohms are acceptable. An LED lamp may be connected between the Video Sense terminal and ground for remote indication of video status.

## 4.5 Baseband Encoder Interface

The baseband encoder interface allows the modulator to be used in a baseband video scrambling system. Baseband encoded scrambling requires a baseband encoder interface board assembly part number 9001-2037 in the video modulator module. This assembly replaces the normal sync tip clamp circuit with a gated clamp which is enabled only during the appropriate time interval for video sync.

Timing information is supplied to the modulator by an encode gate signal originating in the baseband encoder. The encode gate timing pulses trigger a series of one-shot

timers and associated electronic switches in the encoder interface board assembly. This process gates on the clamping circuits during the suppressed sync interval.

Refer to the block diagram, Figure 4-5, and timing diagram, Figure 4-6.

Central to the operation of the baseband encoder interface assembly is a current mode (Norton) amplifier, U4, acting as a sync level sensing feedback element between the modulator's video amplifier output and the bias input. This circuit automatically adjusts the sync clamping level so that current through R10, into the non-inverting input

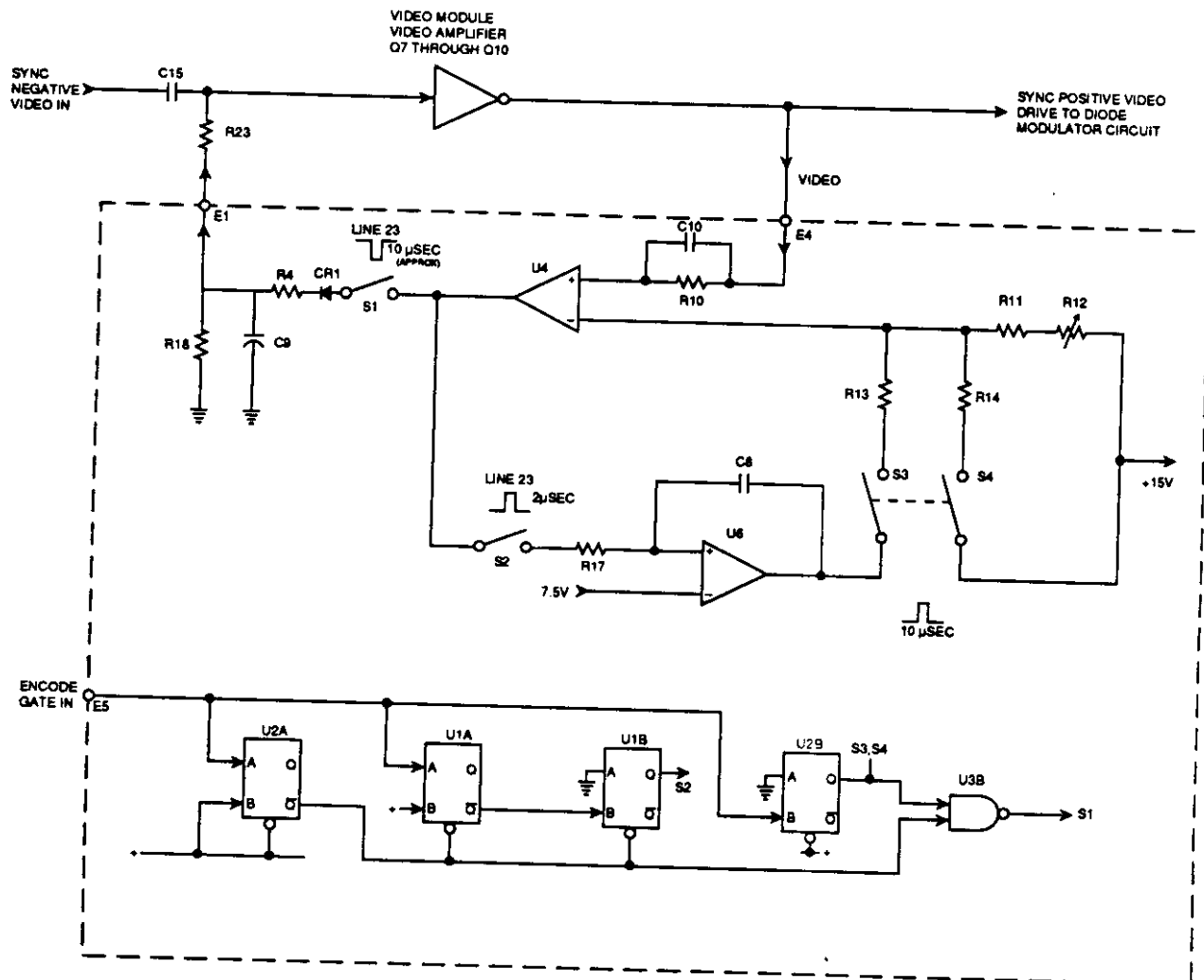


Figure 4-5  
Baseband Encoder Interface Assembly, Block Diagram

of U4, matches the reference inverting input current of U4.

In the non-scrambled mode the reference current to the U4 inverting input is set by variable resistor R12 in series with R11. The encoded gate line remains inactive, (high) thus preventing operation of the one-shot timers and electronic switches. Electronic switch S1 is closed; S2, S3 and S4 are open, allowing U4 and associated components to act as a conventional sync tip referenced clamp circuit. Variable resistor R12 calibrates the video bias level, as required for

normal sync by adjusting the reference current into U4. In the scrambled mode, the encode gate line is activated. This causes operation of the one-shot timers and the electronic switches, as indicated in the timing diagram. At the beginning of the vertical sync interval, sync is not suppressed and the encode gate line remains inactive. Beginning at line 23, sync is suppressed by the encoder and the encode gate line is driven low as shown in the timing diagram.

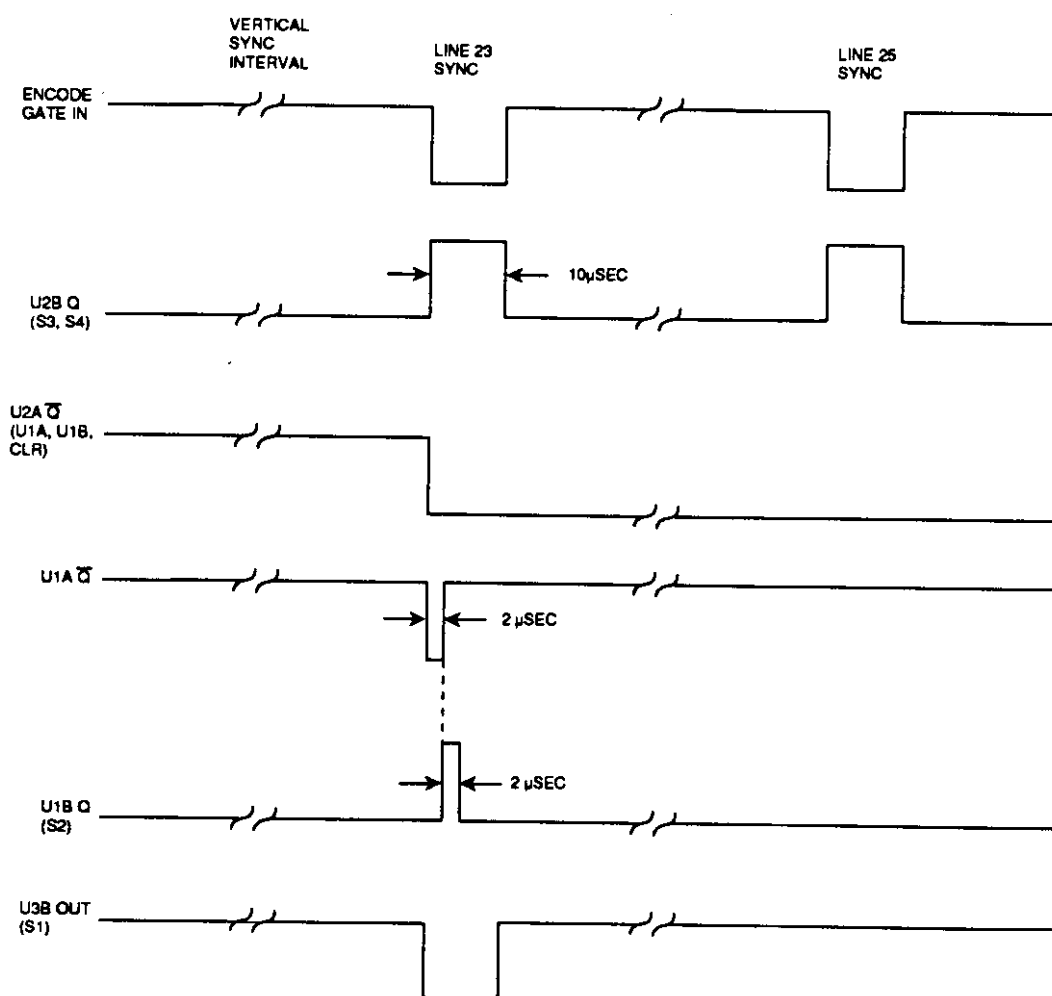


Figure 4-6  
Baseband Encoder Interface Assembly, Timing Diagram

At the initiation of sync suppression, electronic switch S1 opens for a time period equal to the low state of the enable gate.

Electronic switch S2 closes for two microsecond; S3 and S4 close for ten microseconds. This switching sequence closes the feedback loop around U4 and the integrator circuit, U6, C8 and R17. At this time, the U4 inverting input reference current includes R11/R12, R13, and U6/R14 current paths.

The feedback loop circuit, including integrator U6, stabilizes with the sync clamp referenced to the suppressed sync level established at the first line with suppressed sync. The active video component remains at the same bias level as with unscrambled sync. During the remainder of the video frame, electronic switch S1 remains closed and S2 remains open. Further switching of S1 and S2 is inhibited until one-shot U2A can reset during the next vertical interval when the enable gate becomes inactive. To maintain clamping on the suppressed sync amplitude, electronic switches S3 and S2 continue to close for a period of ten microseconds during each line in response to the encode gate signal.

#### 4.6 Audio Subcarrier Processor

Not available at this printing.

## 5.0 PARTS LIST

### 5.1 Introduction

This Section of the manual provides a list of parts for each assembly covered by this manual. The list contains a break down of each assembly by component part number, component description and reference designation. Figure 5-1 shows an exploded view of the ATM-1600 and identifies major subassemblies. Parts location diagrams, Figure 5-2 for the Audio Modulator, Figure 5-3 For the Video Modulator have been provided to assist in locating individual components.

The parts lists contain many abbreviations. Some of the abbreviations used in this list are as follows:

|      |            |
|------|------------|
| BD   | Board      |
| STL  | Steel      |
| ASSY | Assembly   |
| CER  | Ceramic    |
| FXD  | Fixed      |
| MET  | Metal      |
| VAR  | Variable   |
| RAL  | Radial     |
| ADJ  | Adjustable |

### 5.2 Ordering Information

When ordering replacement parts, give the quantity, reference designator, part number and description for each item ordered. The part that will be supplied against an order for a replacement item may not be an exact duplicate of the original part; however, it will be a satisfactory replacement differing only in minor mechanical or electrical characteristics. Such differences will not impair the operation of the equipment.

Catel maintains a complete stock of replacement parts for your Catel equipment. We recommend ordering all replacement parts from Catel to ensure compatibility of components and having your order filled promptly.

Order from:  
Catel Telecommunications  
4050 Technology Place  
Fremont, CA 94537-5122

| PART NUMBER                               | DESCRIPTION                            | REFERENCE DESIGNATOR |
|-------------------------------------------|----------------------------------------|----------------------|
| <b>9001-2031-XX ATM-1600, FINAL ASSY.</b> |                                        |                      |
| 2832-0802                                 | NUT, KEP. 6-32X5/16A/F. STEEL/CAD. PL. |                      |
| 6012-0365-XX                              | PANEL ATM-1600                         |                      |
| 6014-0084                                 | MODULE ASSY, CHASSIS, T.V. MODULATOR   |                      |
| 6033-0116                                 | FAB HANDLE AM MODULATION               |                      |
| 6820-0421                                 | NUT, HEX 4-40 STD. PATT STL/ZINC       |                      |
| 6910-0003                                 | LABEL. MODEL/SERIAL NO.                |                      |
| 7112-0408                                 | SCR. PAN/PHIL. #4-40X1/2 STL/ZN.P      |                      |
| 7122-0403                                 | SCR. FLAT/PHIL. #4-40X3/16 STL/ZN.P    |                      |
| 7122-0606                                 | SCR. FLT/PHIL. #6-32X3/8 STL/ZN.P      |                      |
| 7212-0605                                 | SCR. PHIL/PAN 6-32X5/16 STL/Z IN/WS    |                      |
| 7923-0023                                 | CABLE POWER CORD 3-COND DETACHABLE     |                      |
| 8000-4055                                 | ASSY MODULE POWER SUPPLY, ATM-1600     |                      |
| 8000-2610                                 | ACCESSORY KIT                          |                      |
| 9001-2031-XX                              | ATM-1600 FINAL ASSY. DWG               |                      |

| PART NUMBER | DESCRIPTION | REFERENCE DESIGNATOR |
|-------------|-------------|----------------------|
|-------------|-------------|----------------------|

**5901-0340 ASSY PCB BACK PLANE, ATM-1600**

|              |                                     |                        |
|--------------|-------------------------------------|------------------------|
| 1007-5103    | CAP CER Z5V DISC .01 UF 20% 50V     | C1                     |
| 4612-2106    | INDUCTOR FXD MOLDED 10 UH 10%       | L1                     |
| 4707-0531-08 | INDUCTOR AIR CORE 8T 1/4 22GA       | L3                     |
| 5216-0022    | CLIP LOCKING 2 PIN                  | J1                     |
| 5216-0039    | CONNECTOR "F" PCB                   | J7,8,9,10,11,12, 13,17 |
| 5216-0092    | CONN.COAX.,RF,PCB,PRESS-FIT,COM.BNC | J3,4,5,6               |
| 5216-0105    | CONN CARD EDGE RCPT 2X22 .156 ST    | J15                    |
| 5216-0107    | CONN CARD EDGE 20 PIN DUAL          | J14                    |
| 5223-0012    | TERMINAL BLOCK 3POS .250C/C ST      | J2                     |
| 5223-0036    | TERMINAL BLOCK 2POS SCR CONN        | J16                    |
| 5900-0340    | FAB PCB BACK PLANE                  |                        |
| 7921-0012    | CABLE COAX SEMI-RGD.75 OHM.085DIA   |                        |

**8000-4055 ASSY MODULE POWER SUPPLY, ATM-1600**

|           |                                        |  |
|-----------|----------------------------------------|--|
| 5901-0340 | ASSY PCB, BACK PLANE, ATM-1600         |  |
| 5501-0040 | SWITCH, ROCKER SPDT 5A120V PNLMT       |  |
| 5601-0023 | CONN., AC POWER, FILTERED 6J4          |  |
| 5602-0041 | PWR SPLY, SGL OUT 18V/1.25A 90-260 VIN |  |
| 6012-0366 | REAR PANEL FAB, T.V. MODULATOR         |  |
| 7612-0404 | SCR, BINDER/PHIL 4-4-X1/4 STL/ZINC     |  |
| 6014-0083 | CHASSIS, BKT. CRS, TV MDULATOR         |  |
| 7112-0204 | SCR, PAN HD. PHL #2-56X1/4LGN ZN.PL    |  |
| 5101-0255 | ASSY CABLE, 2 CONDUCTORS               |  |
| 5105-0256 | ASSY CABLE, 2 CONDUCTORS               |  |
| 7301-0003 | TUBING, HEAT SHRINK. 1/8D BLACK        |  |
| 7910-2005 | WIRE, STRANDED, 20CA, 7/28 PVC GRN     |  |
| 5227-0020 | TERMINALS SOLDER                       |  |
| 6821-0004 | NUT 3/8" X 32 X 3 1/2 THK. STL/CAD.PL  |  |
| 5562-0001 | FUSE, 1/2A SLOW BLOW (115V OPTION)     |  |
| 5562-0003 | FUSE, 1/4A SLOW BLOW (230V OPTION)     |  |

**5602-0041 ASSY. POWER SUPPLY, SGL OUT 18V/1.25A 90-260 VIN**

(Non-Catel assembly, information provided for reference only; may only be ordered from Catel as a complete assembly under P/N 5602-0041)

|                                  |       |
|----------------------------------|-------|
| JUMPER WIRE                      | J2    |
| JUMPER WIRE                      | J1    |
| RESISTOR CARBON FILM, 57K, 2W    | R2    |
| RESISTOR CARBON FILM, 10R, 1/4W  | R19   |
| RESISTOR CARBON FILM, 15R, 1/4W  | R52   |
| RESISTOR CARBON FILM, 100R, 1/4W | R7,12 |

| PART NUMBER                                                               | DESCRIPTION                     | REFERENCE DESIGNATOR |
|---------------------------------------------------------------------------|---------------------------------|----------------------|
| <b>5602-0041 ASSY. POWER SUPPLY, SGL OUT 18V/1.25A 90-260 VIN (Cont.)</b> |                                 |                      |
|                                                                           | RESISTOR CARBON FILM 330R 1/4W  | R10                  |
|                                                                           | RESISTOR CARBON FILM 470R 1/4W  | R14                  |
|                                                                           | RESISTOR CARBON FILM 3K3 1/4W   | R13                  |
|                                                                           | RESISTOR CARBON FILM 3K9 1/4W   | R15                  |
|                                                                           | RESISTOR CARBON FILM 5K1 1/4W   | R6,8,9               |
|                                                                           | RESISTOR CARBON FILM 27K 1/4W   | R17                  |
|                                                                           | RESISTOR CARBON FILM 2K2 1/4W   | R11                  |
|                                                                           | RESISTOR CARBON FILM 4R7 1/2W   | R21                  |
|                                                                           | RESISTOR METAL FILM 330R 2W     | R16,20               |
|                                                                           | RESISTOR WIRE WOUND NF OR56 1W  | R3                   |
|                                                                           | VR 2K                           | VR1                  |
|                                                                           | NTS 5R0                         | R1                   |
|                                                                           | CAPACITOR EL SM 47 $\mu$ 25V    | C8                   |
|                                                                           | CAPACITOR EL KME 1000 $\mu$ 25V | C17,18               |
|                                                                           | CAPACITOR EL SME 1000 $\mu$ 25V | C20,21               |
|                                                                           | CAPACITOR "TANTA" 1 $\mu$ 16V   | C15                  |
|                                                                           | CAPACITOR EL SMG 100 $\mu$ 400V | C7                   |
|                                                                           | CAPACITOR "X" .1 $\mu$ 250V     | C1                   |
|                                                                           | CAPACITOR "Y" 2200P 400V        | C6                   |
|                                                                           | CAPACITOR POLYESTER 152 50V     | C4                   |
|                                                                           | CAPACITOR POLYESTER 103 50V     | C11,12,13,14         |
|                                                                           | CAPACITOR CREAMIC 102 1KV       | C22                  |
|                                                                           | CAPACITOR CERAMIC 103 1KV       | C3                   |
|                                                                           | CAPACITOR CERAMIC 471 2KV       | C10                  |
|                                                                           | INDUCTOR                        | L4                   |
|                                                                           | INDUCTOR                        | L1                   |
|                                                                           | TRANSFORMER                     | T2                   |
|                                                                           | C-M CHOKE                       | T1                   |
|                                                                           | BRIDGE DIODE                    | DB1                  |
|                                                                           | ZENER DIODE 18V 1W              | DZ1                  |
|                                                                           | SCR                             | SCR1                 |
|                                                                           | FAST RECOVERY DIODE             | D4                   |
|                                                                           | FAST RECOVERY DIODE             | D7, D6               |
|                                                                           | MOSFET                          | Q1                   |
|                                                                           | IC                              | IC3                  |
|                                                                           | IC (CTR:60-130%) PC713          | IC1                  |
|                                                                           | IC                              | IC2                  |
|                                                                           | CONNECTOR-PIN HEADER 5273-04    | TB2                  |
|                                                                           | CONNECTOR-PIN HEADER 5277-02    | TB1                  |
|                                                                           | FUSE CLIP                       | (F1)                 |
|                                                                           | FUSE 2A 250V                    | F1                   |
|                                                                           | TRANSISTOR SOCKET               | (IC2)                |

| PART NUMBER                                                               | DESCRIPTION                           | REFERENCE DESIGNATOR            |
|---------------------------------------------------------------------------|---------------------------------------|---------------------------------|
| <b>5602-0041 ASSY. POWER SUPPLY, SGL OUT 18V/1.25A 90-260 VIN (Cont.)</b> |                                       |                                 |
|                                                                           | TRANSISTOR SOCKET                     | (SCR1)                          |
|                                                                           | SONY BOND                             | (L1)                            |
|                                                                           | HEAT SINK                             | HS1                             |
|                                                                           | HEAT SINK CLIP                        | (HSQ1)                          |
|                                                                           | LABEL "S/N"                           | (C7)                            |
|                                                                           | LABEL "SPECIFICATION"                 | (C18)                           |
|                                                                           | PCB (88, 18)                          |                                 |
|                                                                           | SILICON RUBBER                        | (R2,16)                         |
|                                                                           | SILICON RUBBER TUBE                   | (HS1-Q1)                        |
| <b>8000-4056 SUBASSY. AUDIO BD., ATM-1600</b>                             |                                       |                                 |
| 5901-0344                                                                 | ASSY PCB AUDIO MODULATOR, ATM-1600    |                                 |
| 6822-0421                                                                 | NUT, KEP 4-40 1/4AF STD PATT STL/Z    |                                 |
| 7112-0406                                                                 | SCR.PAN/PHIL.#4-40X3/8 STL/ZN.P       |                                 |
| 7921-0014                                                                 | CABLE, COAX.RG187A/U. TEFLON          |                                 |
| <b>8000-4057 SUBASSY. VIDEO BD., ATM-1600</b>                             |                                       |                                 |
| 5901-0343                                                                 | ASSY PCB ATM-1600 VIDEO MODULATOR     |                                 |
| 5901-0348                                                                 | ASSY PCB BAR GRAPH                    |                                 |
| 6822-0421                                                                 | EA NUT, KEP 4-40 1/4AF STD PATT STL/Z |                                 |
| 7112-0406                                                                 | EA SCR.PAN/PHIL.#4-40X3/8 STL/ZN.P    |                                 |
| 7921-0014                                                                 | CABLE, COAX.RG187A/U. TEFLON          |                                 |
| <b>5901-0344 ASSY PCB AUDIO MODULATOR, ATM-1600</b>                       |                                       |                                 |
| 1011-2826                                                                 | CAP MICA DIPPED 82 PF 1% 500 V        | C53                             |
| 1045-2186                                                                 | CAP CER NPO DISC 18 PF 5% 500V        | C52                             |
| 1156-3277                                                                 | CAP CER X5F DISC 270 PF 10% 1KV       | C1,2,3,8                        |
| 1182-4754                                                                 | CAP POLSTRN FILM TBL 7500PF2.5%125V   | C12                             |
| 1219-0002                                                                 | CAP AL 100 UF 80/20% 35V              | C11                             |
| 1219-0014                                                                 | CAP AL 22 UF 20% 35V 2000H/85C        | C6,7,10,18,22,42,9              |
| 1256-1226                                                                 | CAP TANT PLZD SOL DIPP 2.2UF 10%35V   | C26                             |
| 1256-1686                                                                 | CAP TANT PLZD SOL DIPP 6.8UF 10%35V   | C4,5                            |
| 1287-5103                                                                 | CAP CER ML Z5U DIPPED .01UF 20%50V    | C57,58,59,66,68 C17,21,29,67,   |
| 1287-6103                                                                 | CAP CER ML Z5U DIPPED .1 UF 20% 50V   | C13,27,28,34,35 C60,61,64,65,41 |
| 1287-7103                                                                 | CAP CER ML Z5U DIPPED 1 UF 20% 50V    | C23,24,30                       |
| 1295-2474                                                                 | CAP CER ML NPO 47 PF 5% 100V          | C31                             |
| 1295-3333                                                                 | CAP CER ML NPO 330 PF 5% 50V          | C19,20                          |
| 1300-0016                                                                 | CAP VAR CER 1.2-6.5PF 250V            | C40                             |
| 1366-6333                                                                 | CAP CER ML X7R .33 UF 10% 100V        | C25                             |
| 152089-6                                                                  | TRANSFORMER                           | T1                              |
| 153316-16                                                                 | INDUCTOR, ADJUSTABLE, 16.5T           | L4,7                            |
| 2045-2430                                                                 | RES FXD CARB COMP 1W 43 OHM 5%        | R62                             |

| PART NUMBER                                                 | DESCRIPTION                          | REFERENCE DESIGNATOR                                                    |
|-------------------------------------------------------------|--------------------------------------|-------------------------------------------------------------------------|
| <b>5901-0344 ASSY PCB AUDIO MODULATOR, ATM-1600 (cont.)</b> |                                      |                                                                         |
| 2055-2100                                                   | RES FXD CARB FILM 1/4W 10 OHM 5%     | R70                                                                     |
| 2055-2750                                                   | RES FXD CARB FILM 1/4W 75 OHM 5%     | R2,50                                                                   |
| 2055-3100                                                   | RES FXD CARB FILM 1/4W 100 OHM 5%    | R35,47                                                                  |
| 2055-3220                                                   | RES FXD CARB FILM 1/4W 220 OHM 5%    | R18                                                                     |
| 2055-3470                                                   | RES FXD CARB FILM 1/4W 470 OHM 5%    | R31                                                                     |
| 2055-3510                                                   | ES FXD CARB FILM 1/4W 510 OHM 5%     | R57                                                                     |
| 2055-4100                                                   | ES FXD CARB FILM 1/4W 1K OHM 5%      | R34,41                                                                  |
| 2055-4150                                                   | ES FXD CARB FILM 1/4W 1.5K OHM 5%    | R36                                                                     |
| 2055-4200                                                   | ES FXD CARB FILM 1/4W 2K OHM 5%      | R46,79                                                                  |
| 2055-4360                                                   | ES FXD CARB FILM 1/4W 3.6K OHM 5%    | R37                                                                     |
| 2055-4390                                                   | ES FXD CARB FILM 1/4W 3.9K OHM 5%    | R78                                                                     |
| 2055-4430                                                   | ES FXD CARB FILM 1/4W 4.3K OHM 5%    | R73                                                                     |
| 2055-4470                                                   | ES FXD CARB FILM 1/4W 4.7K OHM 5%    | R42,45,49                                                               |
| 2055-5100                                                   | ES FXD CARB FILM 1/4W 10K OHM 5%     | R3,4,7,10,11,12,17, R21-<br>25,32,33,39,40 R43,48,63,64,67<br>R71,72,77 |
| 2055-5220                                                   | RES FXD CARB FILM 1/4W 22K OHM 5%    | R68                                                                     |
| 2055-5270                                                   | RES FXD CARB FILM 1/4W 27K OHM 5%    | R60                                                                     |
| 2055-5330                                                   | RES FXD CARB FILM 1/4W 33K OHM 5%    | R76                                                                     |
| 2055-5470                                                   | RES FXD CARB FILM 1/4W 47K OHM 5%    | R20,26,27                                                               |
| 2055-5910                                                   | RES FXD CARB FILM 1/4W 91K OHM 5%    | R30                                                                     |
| 2055-6100                                                   | RES FXD CARB FILM 1/4W 100K OHM 5%   | R5,6,8,9,19,65,69,74                                                    |
| 2055-6150                                                   | RES FXD CARB FILM 1/4W 150K OHM 5%   | R55                                                                     |
| 2055-6180                                                   | RES FXD CARB FILM 1/4W 180K OHM 5%   | R28,29                                                                  |
| 2061-3121                                                   | RES FXD MET FILM 1/8W 121 OHM 1%     | R66                                                                     |
| 2061-3511                                                   | RES FXD MET FILM 1/8W 511 OHM 1%     | R14                                                                     |
| 2061-4130                                                   | RES FXD MET FILM 1/8W 1.3K OHM 1%    | R83                                                                     |
| 2061-4178                                                   | RES FXD MET FILM 1/8W 1.78K OHM 1%   | R61                                                                     |
| 2061-4274                                                   | RES FXD MET FILM 1/8W 2.74K OHM 1%   | R75                                                                     |
| 2061-5133                                                   | RES FXD MET FILM 1/8W 13.3K OHM 1%   | R13                                                                     |
| 2061-5200                                                   | RES FXD MET FILM 1/8W 20K OHM 1%     | R53                                                                     |
| 2061-5332                                                   | RES FXD MET FILM 1/8W 33.2K OHM 1%   | R15                                                                     |
| 2061-5402                                                   | RES FXD MET FILM 1/8W 40.2K OHM 1%   | R54                                                                     |
| 2061-6100                                                   | RES FXD MET FILM 1/8W 100K OHM 1%    | R51,52                                                                  |
| 2226-0014                                                   | RES VAR CER 1-TRN 1/2W 10KOHM 10%    | R38,44                                                                  |
| 2226-0025                                                   | POT 10K                              | R1                                                                      |
| 2326-0006                                                   | RES VAR M-TRN 1/2W 10K OHM10% T/ADJ  | R58                                                                     |
| 2326-0104                                                   | RES VAR M-TRN 1/2W 100K OHM10% T/ADJ | R56                                                                     |
| 2601-0005                                                   | RES 1.0 OHM 1% 1W WIREWOUND          | R16                                                                     |
| 3120-0003                                                   | DIODE 1N4154                         | CR3,4,5,6                                                               |
| 3120-0006                                                   | DIODE 1N4148                         | CR1                                                                     |
| 3151-0026                                                   | DIODE VARACTOR MV409 26-32PF 20VR    | CR2                                                                     |

| PART NUMBER                                                 | DESCRIPTION                        | REFERENCE DESIGNATOR             |
|-------------------------------------------------------------|------------------------------------|----------------------------------|
| <b>5901-0344 ASSY PCB AUDIO MODULATOR, ATM-1600 (cont.)</b> |                                    |                                  |
| 3231-1004                                                   | TRANS SILICON NPN GENL PRP 2N3904  | Q6                               |
| 3231-2026                                                   | TRANS SILICON NPN UHF-VHF NE41632  | Q3,5                             |
| 3241-1006                                                   | TRANS SILICON PNP GNL PRP 2N3906   | Q4                               |
| 3311-0008                                                   | IC LIN VREG +5V LM7805CT VS=35V    | Q2                               |
| 3311-0028                                                   | IC LIN VREG +15V LM7815CT VS=35V   | Q1                               |
| 3312-0053                                                   | IC LIN OP AMP LF353N DUAL VS=18    | U1                               |
| 3312-0074                                                   | IC LIN OP AMP LM358N DUAL          | U6                               |
| 3313-0034                                                   | IC LIN FREQ SYN MB1504P PLL        | U4                               |
| 3322-0020                                                   | IC DIG FF DUAL D 74AC74PC CMOS     | U2                               |
| 3325-0035                                                   | IC DIG COUNTER 74HC4040N 12-STAGE  | U3                               |
| 3542-1013                                                   | DIODE RED LED                      | DS1                              |
| 4602-1476                                                   | INDUCTOR FXD MOLDED 4.7 UH 10%     | L5,6                             |
| 4611-1156                                                   | INDUCTOR FXD MOLDED 1.5 UH 10%     | L2                               |
| 4612-2106                                                   | INDUCTOR FXD MOLDED 10 UH 10%      | L1,8,9                           |
| 5222-0037                                                   | 3 POST JACK                        | J6                               |
| 5222-0038                                                   | 2 POST JACK                        | J2,3,4,5                         |
| 5701-0001                                                   | ATM1600 AUDIO PLD                  | U5                               |
| 5900-0344                                                   | FAB PCB ATM-1600 AUDIO MODULATOR   |                                  |
| 7921-0014                                                   | CABLE,COAX.RG187A/U. TEFLON        |                                  |
| 860010-119                                                  | CAP,ELECT,RADIAL,1UF,50V           | C16,32,33 C56,62                 |
| 860010-121                                                  | CAP,ELECT,RAD,3.3UF,50V            | C55                              |
| 860010-123                                                  | CAP,EL,RAD,10UF,16V+75-10          | C54                              |
| 860049-115                                                  | IC LIN OP AMP CA3240AE VS=36V      | U9,10                            |
| 860049-32                                                   | IC LIN IF/RF AMP CA3028AS          | U7,8                             |
| 900048-103                                                  | CAP CER N330 DISC 5.1 PF 5% 500V   | C44                              |
| 900048-104                                                  | CAP CER N750 DISC 5.1 PF 5% 500V   | C47                              |
| 900048-32                                                   | CAP CER NPO DISC 20 PF 5% 500V     | C48                              |
| 900048-49                                                   | CAP CER X5F DISC 100 PF 10% 500V   | C63                              |
| 900048-9                                                    | CAP CER NPO DISC 2.2 PF .25 500V   | C39,46                           |
| 900066-1                                                    | SWITCH,SLIDE T.V.                  | SW1,2                            |
| 1287-4103                                                   | CAP CER 1000PF PER MIL-C-11015     | C14,15,36,37 C38,43,45,49 C50,51 |
| 2061-5165                                                   | RES 16.5K 1/8W 1%                  | R59                              |
| 1N751A                                                      | DIODE,ZENER                        | CR1                              |
| 2055-41802                                                  | RES FXD CARB FILM 1/4W 1.8K OHM 5% | R1                               |
| 5220-00122                                                  | HDR ASSY 1X22 .025 SQ .100 RT ANG  | J1                               |
| 5900-0348                                                   | FAB PCB BAR GRAPH                  |                                  |
| 860026-27                                                   | I.C. LED DISPLAY                   | U1,2                             |
| <b>5901-0343 ASSY PCB ATM-1600 VIDEO MODULATOR</b>          |                                    |                                  |
| 1011-2476                                                   | CAP MICA DIPPED 47 PF 1% 500 V     | C66                              |
| 1011-3226                                                   | CAP MICA DIPPED 220 PF 1% 500 V    | C57                              |
| 1015-3106                                                   | CAP MICA DIPPED 100PF 5% 500V      | C49                              |

| PART NUMBER                                                | DESCRIPTION                         | REFERENCE DESIGNATOR                                                                                                                                     |
|------------------------------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>5901-0343 ASSY PCB ATM-1600 VIDEO MODULATOR (cont.)</b> |                                     |                                                                                                                                                          |
| 1015-4114                                                  | CAP MICA DIPPED 1100PF 5% 100V      | C86                                                                                                                                                      |
| 1043-2107                                                  | CAP CER NPO DISC 10 PF 5 % 1 KV     | C64,67                                                                                                                                                   |
| 1044-1153                                                  | CAP CER NPO DISC 1.5 PF .25 50 V    | C16,59                                                                                                                                                   |
| 1045-2126                                                  | CAP CER NPO DISC 12 PF 5% 500V      | C46                                                                                                                                                      |
| 1045-2133                                                  | CAP CER NPO DISC 13 PF 5% 50V       | C82                                                                                                                                                      |
| 1045-2156                                                  | CAP CER NPO DISC 15 PF 5% 50 V      | C121                                                                                                                                                     |
| 1045-2186                                                  | CAP CER NPO DISC 18 PF 5% 500V      | C37,38                                                                                                                                                   |
| 1106-2227                                                  | CAP CER N750 DISC 22 PF 10% 1KV     | C47                                                                                                                                                      |
| 1186-4153                                                  | CAP POLY MET MLD RECT.0015UF 10%63V | C87                                                                                                                                                      |
| 1191-2916                                                  | CAP MICA DIPPED 91 PF 1% 500V       | C14,81,85                                                                                                                                                |
| 1219-0015                                                  | CAP AL 1000UF 20% 16V 1000H/85C     | C92                                                                                                                                                      |
| 1219-0023                                                  | CAP AL 100 UF 20% 25V 2000H/85C     | C13,21,22                                                                                                                                                |
| 1256-1106                                                  | CAP TANT PLZD SOL DIPP 1 UF 10%35V  | C20,40,41                                                                                                                                                |
| 1256-2106                                                  | CAP TANT PLZD SOL DIPP 10 UF 10%35V | C25,39,71,76,90                                                                                                                                          |
| 1256-2227                                                  | CAP TANT PLZD SOL DIPP 22 UF 10%50V | C91                                                                                                                                                      |
| 1287-4103                                                  | CAP CER ML X7R DIPPED 1000PF 10%50V | C23,24,42 43,44,45,48 50,51,54,55<br>56,58,63 110,111,112 113,116,118,<br>143,124,125 127,128,130 131,132,<br>134 135,136,137 138,139,140<br>141,142,144 |
| 1287-5103                                                  | CAP CER ML Z5U DIPPED .01UF 20%50V  | C18,61,62 70,72,73,88 89,129                                                                                                                             |
| 1295-2474                                                  | CAP CER ML NPO 47 PF 5% 100V        | C122                                                                                                                                                     |
| 1295-3394                                                  | CAP CER ML NPO 390 PF 5% 100V       | C75                                                                                                                                                      |
| 1400-0010                                                  | CAP VAR AIR 2-10PF 125V             | C120                                                                                                                                                     |
| 152036-3                                                   | TRANSFORMER                         | T10                                                                                                                                                      |
| 152069-12                                                  | INDUCTOR,VARIABLE                   | L37                                                                                                                                                      |
| 152069-6                                                   | INDUCTOR,VARIABLE                   | L36                                                                                                                                                      |
| 152089-6                                                   | TRANSFORMER                         | T3,4,13                                                                                                                                                  |
| 152492-10                                                  | INDUCTOR,POT CORE                   | L3                                                                                                                                                       |
| 152492-11                                                  | INDUCTOR,POT CORE                   | L2,5                                                                                                                                                     |
| 152492-12                                                  | INDUCTOR,POT CORE                   | L6                                                                                                                                                       |
| 152492-16                                                  | INDUCTOR POT CORE                   | L4                                                                                                                                                       |
| 152492-9                                                   | INDUCTOR,POT CORE                   | L7                                                                                                                                                       |
| 152493-5                                                   | TRANSFORMER,ADJ,POT CORE            | T2                                                                                                                                                       |
| 152493-6                                                   | TRANSFORMER,ADJ,POT CORE            | T1                                                                                                                                                       |
| 153316-16                                                  | INDUCTOR,ADJUSTABLE,16.5T           | L10,12                                                                                                                                                   |
| 153343-5                                                   | TRANSFORMER,OUTPUT                  | T7                                                                                                                                                       |
| 153344-4                                                   | TRANSFORMER,MODULE                  | T6                                                                                                                                                       |
| 1650-0007                                                  | CAP 5-50PF TEFLON VAR               | C123                                                                                                                                                     |
| 2015-7180                                                  | RES FXD CARB COMP 1/8W 1.8M OHM 5%  | R138                                                                                                                                                     |
| 2025-4150                                                  | RES FXD CARB COMP 1/4W 1.5K OHM 5%  | R57,137                                                                                                                                                  |
| 2055-1470                                                  | RES FXD CARB FILM 1/4W 4.7 OHM 5%   | R213,177                                                                                                                                                 |
| 2055-2100                                                  | RES FXD CARB FILM 1/4W 10 OHM 5%    | R12,77,199                                                                                                                                               |

| PART NUMBER                                                | DESCRIPTION                        | REFERENCE DESIGNATOR                              |
|------------------------------------------------------------|------------------------------------|---------------------------------------------------|
| <b>5901-0343 ASSY PCB ATM-1600 VIDEO MODULATOR (cont.)</b> |                                    |                                                   |
| 2055-2160                                                  | RES FXD CARB FILM 1/4W 16 OHM 5%   | R166,195                                          |
| 2055-2180                                                  | RES FXD CARB FILM 1/4W 18 OHM 5%   | R161,190                                          |
| 2055-2220                                                  | RES FXD CARB FILM 1/4W 22 OHM 5%   | R168                                              |
| 2055-2270                                                  | RES FXD CARB FILM 1/4W 27 OHM 5%   | R184                                              |
| 2055-2330                                                  | RES FXD CARB FILM 1/4W 33 OHM 5%   | R101,102                                          |
| 2055-2560                                                  | RES FXD CARB FILM 1/4W 56 OHM 5%   | R211,94                                           |
| 2055-2620                                                  | RES FXD CARB FILM 1/4W 62 OHM 5%   | R112                                              |
| 2055-2750                                                  | RES FXD CARB FILM 1/4W 75 OHM 5%   | R89,90,91 169,170,197 198,209                     |
| 2055-3100                                                  | RES FXD CARB FILM 1/4W 100 OHM 5%  | R25,26,29,30 R61,82,85,131                        |
| 2055-3130                                                  | RES FXD CARB FILM 1/4W 130 OHM 5%  | R175                                              |
| 2055-3150                                                  | RES FXD CARB FILM 1/4W 150 OHM 5%  | R186                                              |
| 2055-3180                                                  | RES FXD CARB FILM 1/4W 180 OHM 5%  | R103                                              |
| 2055-3220                                                  | RES FXD CARB FILM 1/4W 220 OHM 5%  | R5,10,18,20,32 R36,196,206,134<br>139,167,210,212 |
| 2055-3270                                                  | RES FXD CARB FILM 1/4W 270 OHM 5%  | R93,95                                            |
| 2055-3300                                                  | RES FXD CARB FILM 1/4W 300 OHM 5%  | R11,164,70,194                                    |
| 2055-3330                                                  | RES FXD CARB FILM 1/4W 330 OHM 5%  | R207                                              |
| 2055-3360                                                  | RES FXD CARB FILM 1/4W 360 OHM 5%  | R98                                               |
| 2055-3430                                                  | RES FXD CARB FILM 1/4W 430 OHM 5%  | R178,183,185, 14                                  |
| 2055-3470                                                  | RES FXD CARB FILM 1/4W 470 OHM 5%  | R3,4,9,17,43 24,27,28,88,99                       |
| 2055-3620                                                  | RES FXD CARB FILM 1/4W 620 OHM 5%  | R120,160 R162,189,191                             |
| 2055-3680                                                  | RES FXD CARB FILM 1/4W 680 OHM 5%  | R122                                              |
| 2055-3820                                                  | RES FXD CARB FILM 1/4W 820 OHM 5%  | R19,104                                           |
| 2055-4100                                                  | RES FXD CARB FILM 1/4W 1K OHM 5%   | R2,8,13,16,60,68 69,83,123,171                    |
| 2055-4130                                                  | RES FXD CARB FILM 1/4W 1.3K OHM 5% | R163,192                                          |
| 2055-4200                                                  | RES FXD CARB FILM 1/4W 2K OHM 5%   | R165,193                                          |
| 2055-4220                                                  | RES FXD CARB FILM 1/4W 2.2K OHM 5% | R73,84,97,172,200                                 |
| 2055-4240                                                  | RES FXD CARB FILM 1/4W 2.4K OHM 5% | R203                                              |
| 2055-4270                                                  | RES FXD CARB FILM 1/4W 2.7K OHM 5% | R133,208                                          |
| 2055-4330                                                  | RES FXD CARB FILM 1/4W 3.3K OHM 5% | R31,96,173                                        |
| 2055-4360                                                  | RES FXD CARB FILM 1/4W 3.6K OHM 5% | R119                                              |
| 2055-5100                                                  | RES FXD CARB FILM 1/4W 10K OHM 5%  | R1,23,34,35 40,41,55,80 86,87,140                 |
| 2055-5120                                                  | RES FXD CARB FILM 1/4W 12K OHM 5%  | R56,204                                           |
| 2055-5220                                                  | RES FXD CARB FILM 1/4W 22K OHM 5%  | R37,59,143                                        |
| 2055-5470                                                  | RES FXD CARB FILM 1/4W 47K OHM 5%  | R58,126                                           |
| 2055-6200                                                  | RES FXD CARB FILM 1/4W 200K OHM 5% | R142                                              |
| 2055-6680                                                  | RES FXD CARB FILM 1/4W 680K OHM 5% | R121                                              |
| 2055-7100                                                  | RES FXD CARB FILM 1/4W 1M OHM 5%   | R75,76                                            |
| 2061-3453                                                  | RES FXD MET FILM 1/8W 453 OHM 1%   | R49                                               |
| 2061-3523                                                  | RES FXD MET FILM 1/8W 523 OHM 1%   | R71                                               |
| 2061-3562                                                  | RES FXD MET FILM 1/8W 562 OHM 1%   | R53                                               |
| 2061-3619                                                  | RES FXD MET FILM 1/8W 619 OHM 1%   | R38                                               |

| PART NUMBER                                                | DESCRIPTION                         | REFERENCE DESIGNATOR   |
|------------------------------------------------------------|-------------------------------------|------------------------|
| <b>5901-0343 ASSY PCB ATM-1600 VIDEO MODULATOR (cont.)</b> |                                     |                        |
| 2061-3825                                                  | RES FXD MET FILM 1/8W 825 OHM 1%    | R44,45                 |
| 2061-4110                                                  | RES FXD MET FILM 1/8W 1.1K OHM 1%   | R33,202                |
| 2061-4150                                                  | RES FXD MET FILM 1/8W 1.5K OHM 1%   | R116,128               |
| 2061-4178                                                  | RES FXD MET FILM 1/8W 1.78K OHM 1%  | R39                    |
| 2061-4200                                                  | RES FXD MET FILM 1/8W 2K OHM 1%     | R72                    |
| 2061-4232                                                  | RES FXD MET FILM 1/8W 2.32K OHM 1%  | R51                    |
| 2061-4249                                                  | RES FXD MET FILM 1/8W 2.49K OHM 1%  | R118                   |
| 2061-4392                                                  | RES FXD MET FILM 1/8W 3.92K OHM 1%  | R115                   |
| 2061-4432                                                  | RES FXD MET FILM 1/8W 4.32K OHM 1%  | R22                    |
| 2061-4470                                                  | RES FXD MET FILM 1/8W 4.7K OHM 1%   | R74,81,117 129,201     |
| 2061-4499                                                  | RES FXD MET FILM 1/8W 4.99K OHM 1%  | R46                    |
| 2061-4634                                                  | RES FXD MET FILM 1/8W 6.34K OHM 1%  | R108                   |
| 2061-5113                                                  | RES FXD MET FILM 1/8W 11.3K OHM 1%  | R136                   |
| 2061-5261                                                  | RES FXD MET FILM 1/8W 26.1K OHM 1%  | R132                   |
| 2135-3330                                                  | RES FXD CARB FILM 1/2W 330 OHM 5%   | R54,187                |
| 2226-0004                                                  | RES VAR CFR 500 OHMS                | R6                     |
| 2226-0007                                                  | RES VAR CER 1-TRN 1/2W 5K OHM 10%   | R127                   |
| 2226-0014                                                  | RES VAR CER 1-TRN 1/2W 10KOHM 10%   | R42,106                |
| 2226-0023                                                  | RES VAR MLD 1W 1K OHM 10% PNL MT    | R15,205                |
| 2226-0026                                                  | RESISTOR VAR. PC MTG 1K 10%         | R7                     |
| 2226-0029                                                  | RES 200 OHM 1/2W                    | R105,176               |
| 2226-0030                                                  | RES VAR PC MT CERMT 100R 1/2W 10%   | R113                   |
| 2226-0031                                                  | RES VAR 1-TRN 1/2W 50 OHM10%T/ADJ   | R100                   |
| 2326-0016                                                  | RES VAR M-TRN 1/2W 1K OHM 10% T/ADJ | R50,52                 |
| 2601-0005                                                  | RES 1.0 OHM 1% 1W WIREWOUND         | R48,188                |
| 3120-0003                                                  | DIODE 1N4154 CR1,2,4,5              | CR6,7                  |
| 3231-1004                                                  | TRANS SILICON NPN GENL PRP 2N3904   | Q15,16,25,27           |
| 3231-2023                                                  | TRANS SILICON NPN AMPLIFIER MPS3563 | Q17                    |
| 3231-2027                                                  | TRANS SILICON NPN AMPLIFIER MPS6521 | Q1,3,5,7 Q9,10,12,13   |
| 3232-4002                                                  | TRANS SILICON NPN POWER AMP PT4579  | Q14,18,19,20,21 Q40,42 |
| 3241-2006                                                  | TRANS SILICON PNP AMPLIFIER MPS6523 | Q2,4,6,8,11,22         |
| 3251-0017                                                  | TEANS JEFT N-CHAN LN 30V 2N4222     | Q26                    |
| 3311-0008                                                  | IC LIN VREG +5V LM7805CT VS=35V     | U2                     |
| 3311-0028                                                  | IC LIN VREG +15V LM7815CT VS=35V    | U3                     |
| 3312-0074                                                  | IC LIN OP AMP LM358N DUAL           | U4                     |
| 3312-0093                                                  | IC LIN VIDEO AMP NE592N             | U10                    |
| 3313-0031                                                  | IC LIN SYNC SEP LM1881N             | U11                    |
| 3400-0039                                                  | AMPL,HYB.500MHZ MSA-304             | U20,21                 |
| 4200-0001                                                  | PKG,CAN,AL.,51SQINTL.,906H          | L36,37                 |
| 4500-0007                                                  | TRANSFORMER SPLITTER                | T5                     |
| 4500-0015                                                  | TRANSFORMER 6T 4:1                  | T12                    |

| PART NUMBER                                                | DESCRIPTION                         | REFERENCE DESIGNATOR         |
|------------------------------------------------------------|-------------------------------------|------------------------------|
| <b>5901-0343 ASSY PCB ATM-1600 VIDEO MODULATOR (cont.)</b> |                                     |                              |
| 4602-0337                                                  | INDUCTOR FXD MOLDED .33 UH 20%      | L19,13                       |
| 4602-1476                                                  | INDUCTOR FXD MOLDED 4.7 UH 10%      | L11,39,43                    |
| 4602-2106                                                  | INDUCTOR FXD MOLDED 10 UH 10%       | L8,14,15,18 L30,31,32 L40,42 |
| 4611-1156                                                  | INDUCTOR FXD MOLDED 1.5 UH 10%      | L34                          |
| 4611-1336                                                  | INDUCTOR FXD MOLDED 3.3 UH 10%      | L20                          |
| 4611-2156                                                  | INDUCTOR FXD MOLDED 15 UH 10%       | L41                          |
| 4612-3105                                                  | INDUCTOR FXD MOLDED 100 UH 5%       | L23                          |
| 4614-1009                                                  | INDUCTOR FXD MOLDED .33 UH 5% /SCD  | L16                          |
| 4614-1013                                                  | INDUCTOR .47UH 5% MOLDED /SCD       | L17                          |
| 5216-0040                                                  | CONNECTOR F FEMALE RT ANGLE PC M    | J4                           |
| 5216-0104                                                  | CONN CARD EDGE RCPT 20 DL .156RTANG | J3                           |
| 5222-0035                                                  | JUMPER MINI FOR                     | J2,5,6,7,8,10                |
| 5222-0037                                                  | 3 POST JACK                         | J5,6,7,10                    |
| 5222-0038                                                  | 2 POST JACK                         | J9,16                        |
| 5222-0039                                                  | JACK, CONNECTOR                     | J8,2                         |
| 5413-1001                                                  | CRYSTAL 45.751 MHZ PER S.C.D        | Y1                           |
| 5900-0343                                                  | FAB PCB ATM-1600 VIDEO MODULATOR    |                              |
| 6163-0001                                                  | PAD TRANS FOR                       | Q14,18,19,20,40, 42          |
| 6820-0421                                                  | NUT,HEX 4-40 STD.PATT STL/ZINC      | FOR J3                       |
| 7114-0410                                                  | SCR,PAN,PHIL#4-40X5/8LG SS          | FOR J3                       |
| 7921-0014                                                  | CABLE,COAX.RG187A/U. TEFLON         |                              |
| 860010-118                                                 | CAP,MONO.,.1UF,50V,20%              | C2,77                        |
| 860010-66                                                  | CAP.,VAR.,2-5PF                     | C60                          |
| 860010-79                                                  | CAP AL 4.7UF 20% 35V 2000/85 RADIAL | C19,15,83                    |
| 860020-3                                                   | CORE,BEAD B1,2,3                    | FOR Q17,21 AND R213          |
| 860026-13                                                  | DIODE                               | CR21,20                      |
| 860026-29                                                  | DIODE                               | CR8,9,10,11                  |
| 860049-115                                                 | IC LIN OP AMP CA3240AE VS=36V       | U6,13                        |
| 860049-32                                                  | IC LIN IF/RF AMP CA3028AS           | U1                           |
| 860049-64                                                  | IC LIN DRIVER LM3914N DISPLAY       | U9                           |
| 860049-86                                                  | IC LIN DRIVER LM3915N GRAPH DIS     | U8                           |
| 860100-15                                                  | THERMISTOR,100 OHMS                 | RT1                          |
| 860101-1                                                   | HEATER,CRYSTAL                      | HR1                          |
| 900048-32                                                  | CAP CER NPO DISC 20 PF 5% 500V      | C17                          |
| 900048-40                                                  | CAP CER N330 DISC 43 PF 5% 500V     | C119                         |
| 900048-44                                                  | CAP CER N750 DISC 62 PF 5% 500V     | C52                          |
| 900048-46                                                  | CAP CER N750 DISC 75 PF 5% 500V     | C53,65                       |
| 900048-49                                                  | CAP CER X5F DISC 100 PF 10% 500V    | C1,84,115                    |
| 900048-85                                                  | CAP CER X5F DISC 3300PF 10% 500V    | C114,117,133                 |
| 900066-1                                                   | SWITCH,SLIDE T.V.                   | SW1                          |
| 900075-13                                                  | CAPACITOR,1675PF                    | C4                           |
| 900075-18                                                  | CAPACITOR,MICA,125PF                | C3                           |

**PARTS LIST****ATM-1600**

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| PART NUMBER | DESCRIPTION | REFERENCE DESIGNATOR |
|-------------|-------------|----------------------|
|-------------|-------------|----------------------|

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**5901-0343 ASSY PCB ATM-1600 VIDEO MODULATOR (cont.)**

|           |                              |        |
|-----------|------------------------------|--------|
| 900075-2  | CAPACITOR,207PF              | C10,11 |
| 900075-24 | CAPACITOR MICA,110PF         | C5     |
| 900075-3  | CAPACITOR,233PF              | C7,8   |
| 900075-4  | CAPACITOR,427PF              | C12    |
| 900075-5  | CAPACITOR,575PF              | C9     |
| 900075-9  | CAPACITOR,550PF              | C6     |
| 900095-1  | SAW FILTER 44.025 MHZ,CTI151 | FL1    |
| 2061-5243 | RESISTOR,24.3K,1/4W,1%       | R109   |
| 2061-6280 | RESISTOR,280K,1/4W,1%        | R107   |
| 2061-3432 | RESISTOR,432 OHMS,1/8W       | R21    |

**9001-2037 ASSY PCB BB ENCODER INTERFACE FOR ATM-1600**

|           |                                     |  |
|-----------|-------------------------------------|--|
| 153525-1  | BASEBAND ENCODER                    |  |
| 5101-0251 | ASSY CABLE 4 PIN CONNECTOR          |  |
| 6820-0421 | NUT,HEX 4-40 STD.PATT STL/ZINC      |  |
| 6842-0002 | WASHER FLAT #4 STL                  |  |
| 6851-0017 | STANDOFF 4-40 1/4 HEX 1/2 LG.THRD.  |  |
| 6852-0039 | SPACER 1/4ID 3/8 OD.,.016 THK.      |  |
| 7112-0414 | SCR.PAN/PHIL.#4-40X7/8 STL/ZN.P     |  |
| 7162-0404 | SCR BINDER/PHIL 4-40X1/4 STL/ZINC   |  |
| 7911-0006 | WIRE,TW.PR,22GA.UL1429,7/30,BLK/YEL |  |

**153525-1 BASEBAND ENCODER INTERFACE**

|           |                                    |            |
|-----------|------------------------------------|------------|
| 1015-3206 | CAP MICA DIPPED 200PF 5% 500V      | C2,4       |
| 1015-4104 | CAP MICA DIPPED 1000PF 5% 100V     | C3,5       |
| 1219-0023 | CAP AL 100 UF 20% 25V 2000H/85C    | C1         |
| 153526-1  | BD,BASE BAND ENC INTRFACE          |            |
| 153527    | SCHEMATIC,BASE BD ENC INTERFACE    |            |
| 153661-1  | CONN ASY,4 PIN                     |            |
| 153662-1  | COMM ASY,2 PIN                     |            |
| 2055-4220 | RES FXD CARB FILM 1/4W 2.2K OHM 5% | R4         |
| 2055-4300 | RES FXD CARB FILM 1/4W 3K OHM 5%   | PR1        |
| 2055-4560 | RES FXD CARB FILM 1/4W 5.6K OHM 5% | R10,11,17  |
| 2055-5100 | RES FXD CARB FILM 1/4W 10K OHM 5%  | R2,5,6,7,8 |
| 2055-5150 | RES FXD CARB FILM 1/4W 15K OHM 5%  | R18        |
| 2055-5270 | RES FXD CARB FILM 1/4W 27K OHM 5%  | R9         |
| 2055-5750 | RES FXD CARB FILM 1/4W 75K OHM 5%  | R14        |
| 2055-6160 | RES FXD CARB FILM 1/4W 160K OHM 5% | R13        |
| 2226-0016 | POT 5K 1/2W 10%                    |            |
| 3323-0014 | IC DIG MULTIVIB MC14528B DUAL CMOS | U2         |
| 3332-0003 | IC DIG ANALOG SW CD4066 QUAD MOS   | U5         |

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| PART NUMBER                                        | DESCRIPTION                              | REFERENCE DESIGNATOR |
|----------------------------------------------------|------------------------------------------|----------------------|
| <b>153525-1 BASEBAND ENCODER INTERFACE (cont.)</b> |                                          |                      |
| 6851-0028                                          | STANDOFF L7/8I,1/4RD,ALM,4-40 THD.       |                      |
| 860010-115                                         | CAP CER ML X7R DIPPD .01 UF,10% 50V      | C7                   |
| 860010-119                                         | CAP,ELECT,RADIAL,1UF,50V                 | C6                   |
| 860010-24                                          | CAPACITOR,0.1UF,100V                     | C8                   |
| 860010-84                                          | CAPACITOR,0.33UF                         | C9                   |
| 860049-112                                         | IC DIG MULTIVIB 74C221 DUAL CMOS         | U1                   |
| 860049-113                                         | IC LIN OP AMP LM359N                     | U4                   |
| 860049-114                                         | IC LIN OP AMP OP081-1P VS=18V            | U6                   |
| 860049-50                                          | IC DIG NAND 2-IN CD4011AE QUAD           | U3                   |
| 860085-10                                          | SOCKET,16 PIN DIP                        |                      |
| 860085-9                                           | SOCKET,14 PIN DIP                        |                      |
| 900034-124                                         | RES FXD CARB FILM 1/4W 120K OHM 5%       | R3                   |
| 900048-37                                          | CAP CER NPO DISC 33 PF 5% 500V           | C10                  |
| 900048-57                                          | CAP CER X5F DISC 220 PF 10% 500V         | C11                  |
| <b>8000-2610 ATM-1600 ACCESSORY KIT (F CONN)</b>   |                                          |                      |
| 5120-1060                                          | CABLE, COAX 6.00" (2) F CONN             |                      |
| 5211-0026                                          | TERMINATOR MALE BNC                      |                      |
| 6910-0015                                          | PACKING SLIP                             |                      |
| 7157-1010                                          | SCR. PHIL W/NYLON WSHR 10-32 X 5/8"      |                      |
| 7600-0029                                          | PLASTIC BAG, 9" X 12" X 4 MIL RECLOSABLE |                      |
| 5218-0028                                          | TERMINATION, 75 OHM, F DC-550 MHZ        |                      |
| 0020-5020                                          | ATM-1600 BROADCAST TV MOD. MANUAL        |                      |
| <b>8000-2611 ATM-1600 ACCESSORY KIT (BNC CONN)</b> |                                          |                      |
| 5120-2050                                          | CABLE, COAX 6.00" (2) BNC CONN           |                      |
| 5211-0026                                          | TERMINATOR MALE BNC                      |                      |
| 6910-0015                                          | PACKING SLIP                             |                      |
| 7157-1010                                          | SCR. PHIL W/NYLON WSHR 10-32 X 5/8"      |                      |
| 7600-0029                                          | PLASTIC BAG, 9" X 12" X 4 MIL RECLOSABLE |                      |
| 5218-0028                                          | TERMINATION, 75 OHM, F DC-550 MHZ        |                      |
| 0020-5020                                          | ATM-1600 BROADCAST TV MOD. MANUAL        |                      |

- 1 6014-0084 Module Assy. Chassis
- 2 6012-0365-XX Front Panel
- 3 6033-0118 Fab Handle. AM Modulator
- 4 8000-4055 Assy Module. Power Supply
- 5 9001-2032 Subassy. Audio Board
- 6 9001-2035 Subassy. Video Board
- 7 9001-2037 Assy. PCB BB Encoder Interface

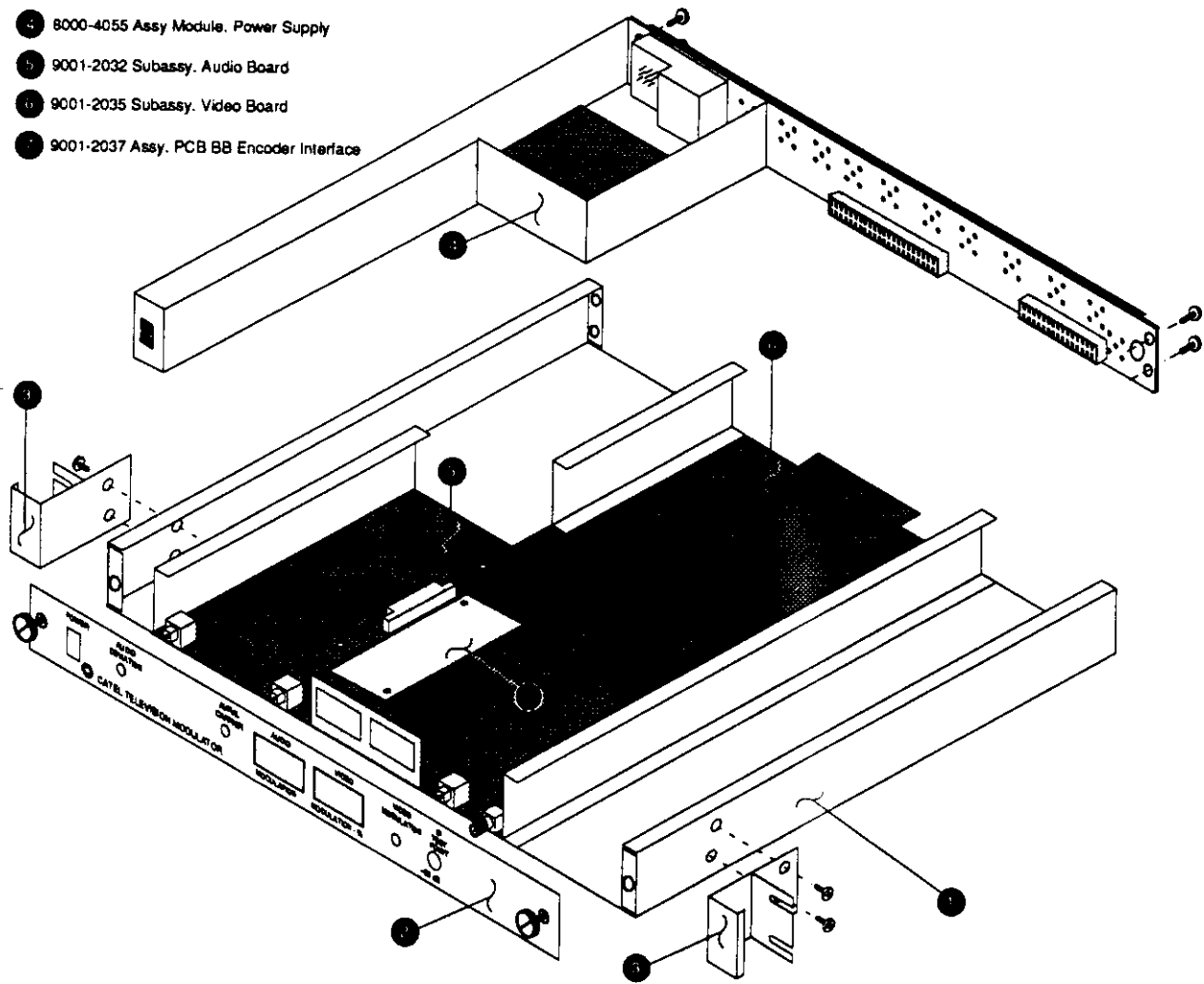


Figure 5-1  
ATM-1600 Final Assembly  
Internal View

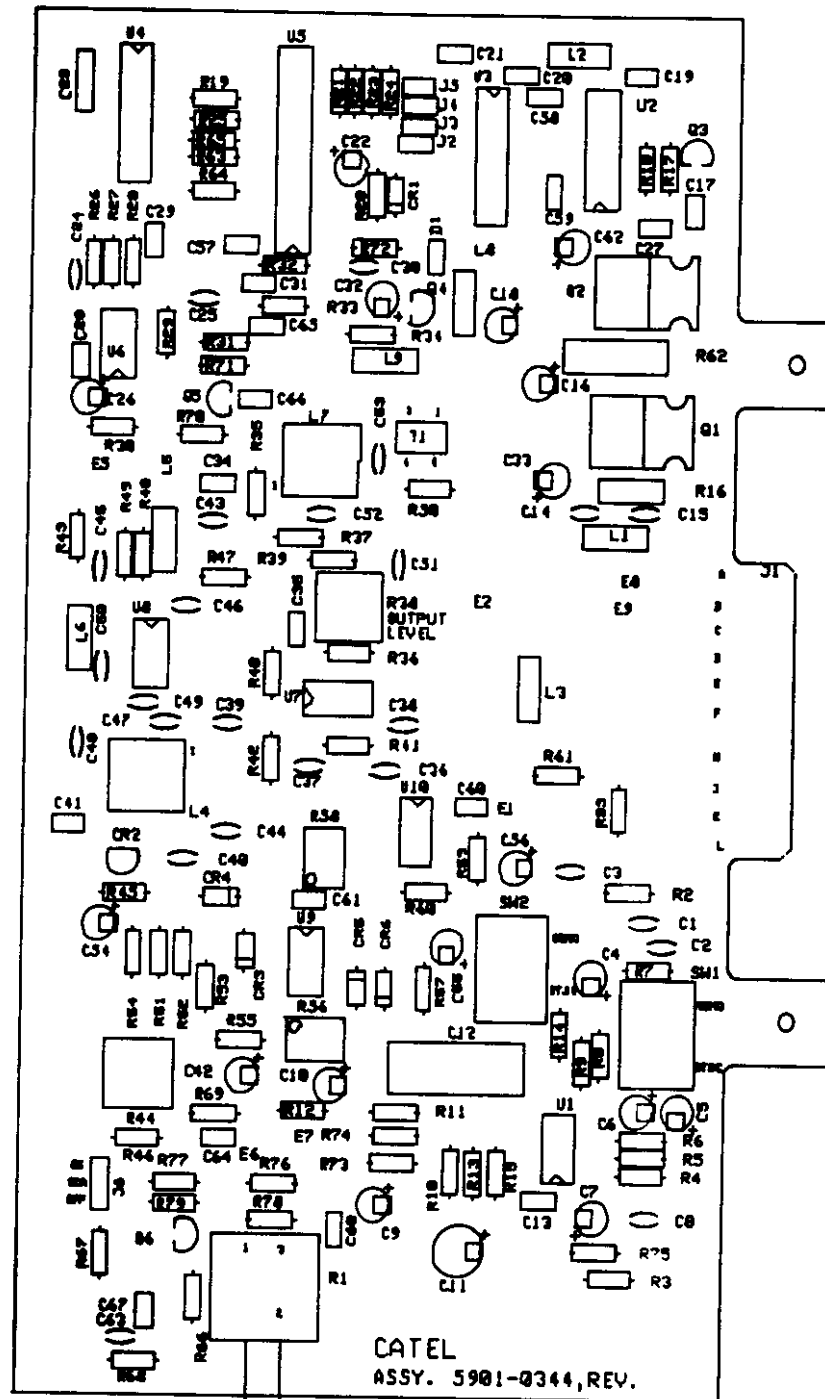


Figure 5-2  
PCB Parts Location Diagram  
Audio Modulator



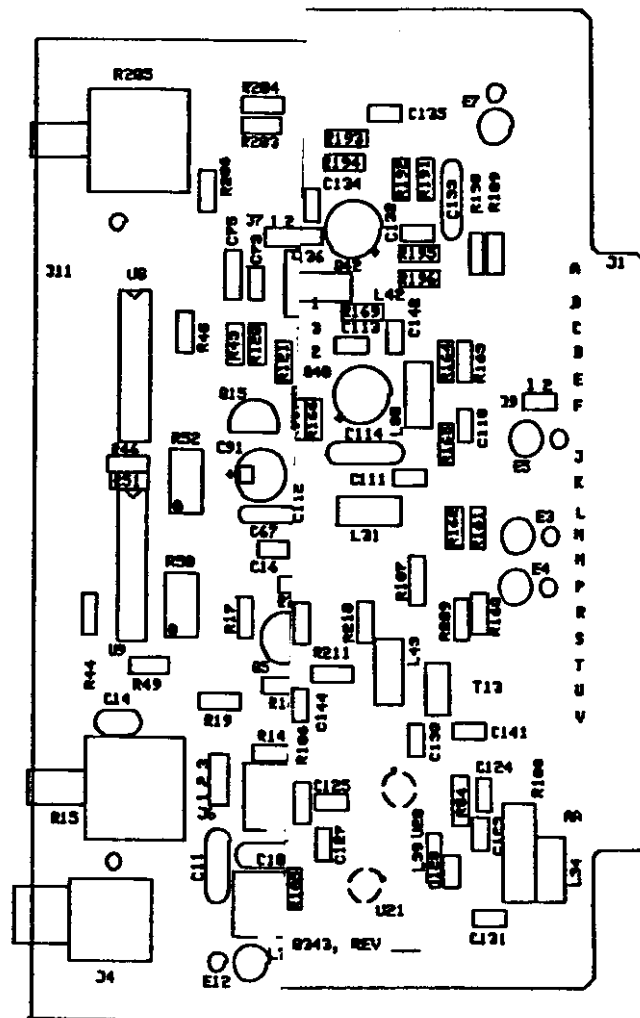


Figure 5-3  
PCB Parts Location Diagram  
Video Modulator