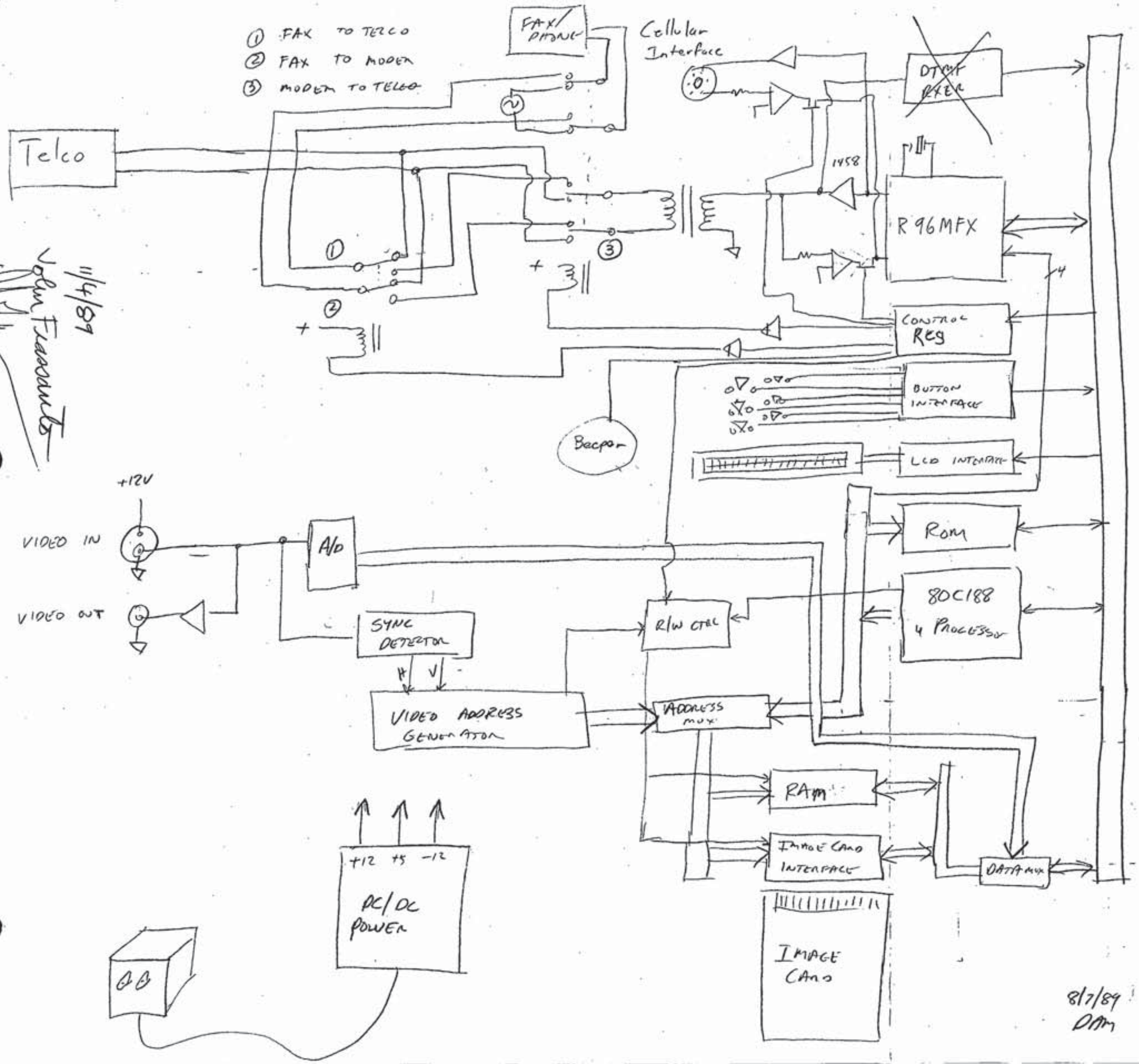
EXHIBIT 6



11/4/89

John Fr[illegible]

EXHIBIT 7

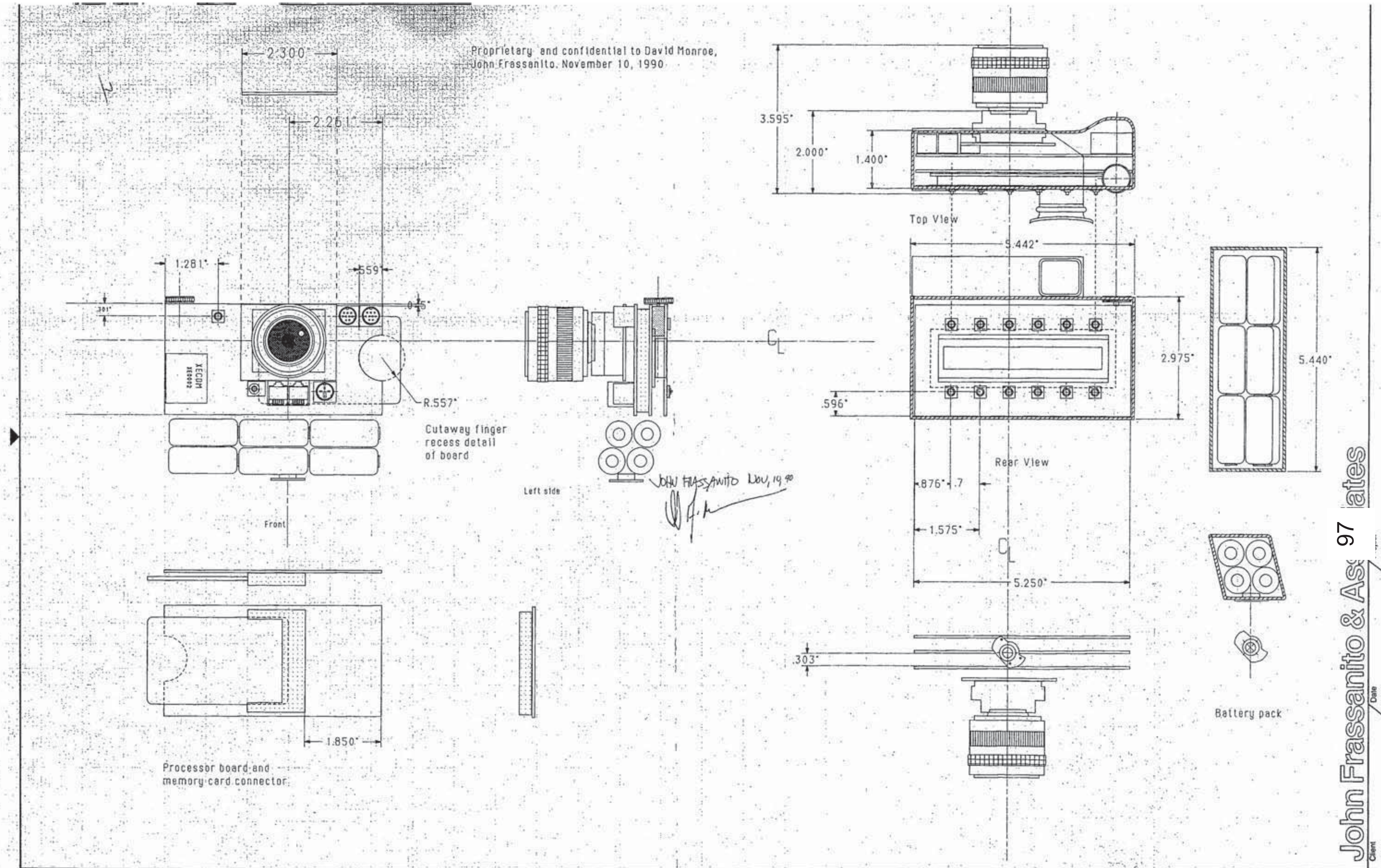

Proprietary and confidential to David Monroe,
John Frassanito, November 10, 1990
2.300"
2.261"
1.281"
.559"
.301"
.015"
XECOM
XE0002
R.557"
Cutaway finger
recess detail
of board
Front
Left side
John Frassanito Nov, 19, 90
1.850"
Processor board and
memory card connector
3.595"
2.000"
1.400"
Top View
5.442"
2.975"
5.440"
.596"
Rear View
.876"
.7
1.575"
5.250"
.303"
Battery pack
John Frassanito & Associates
Client
Date

EXHIBIT 8

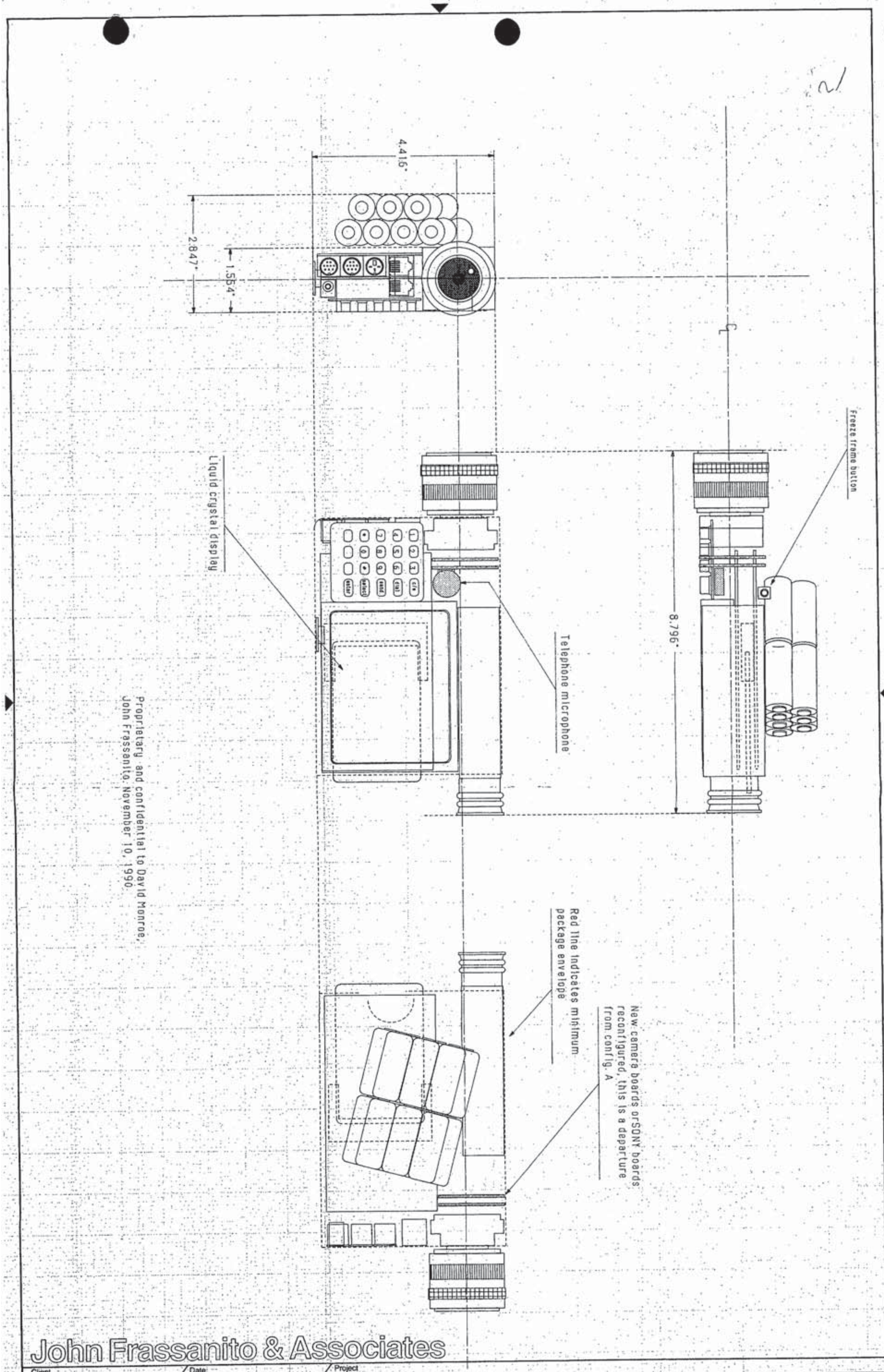
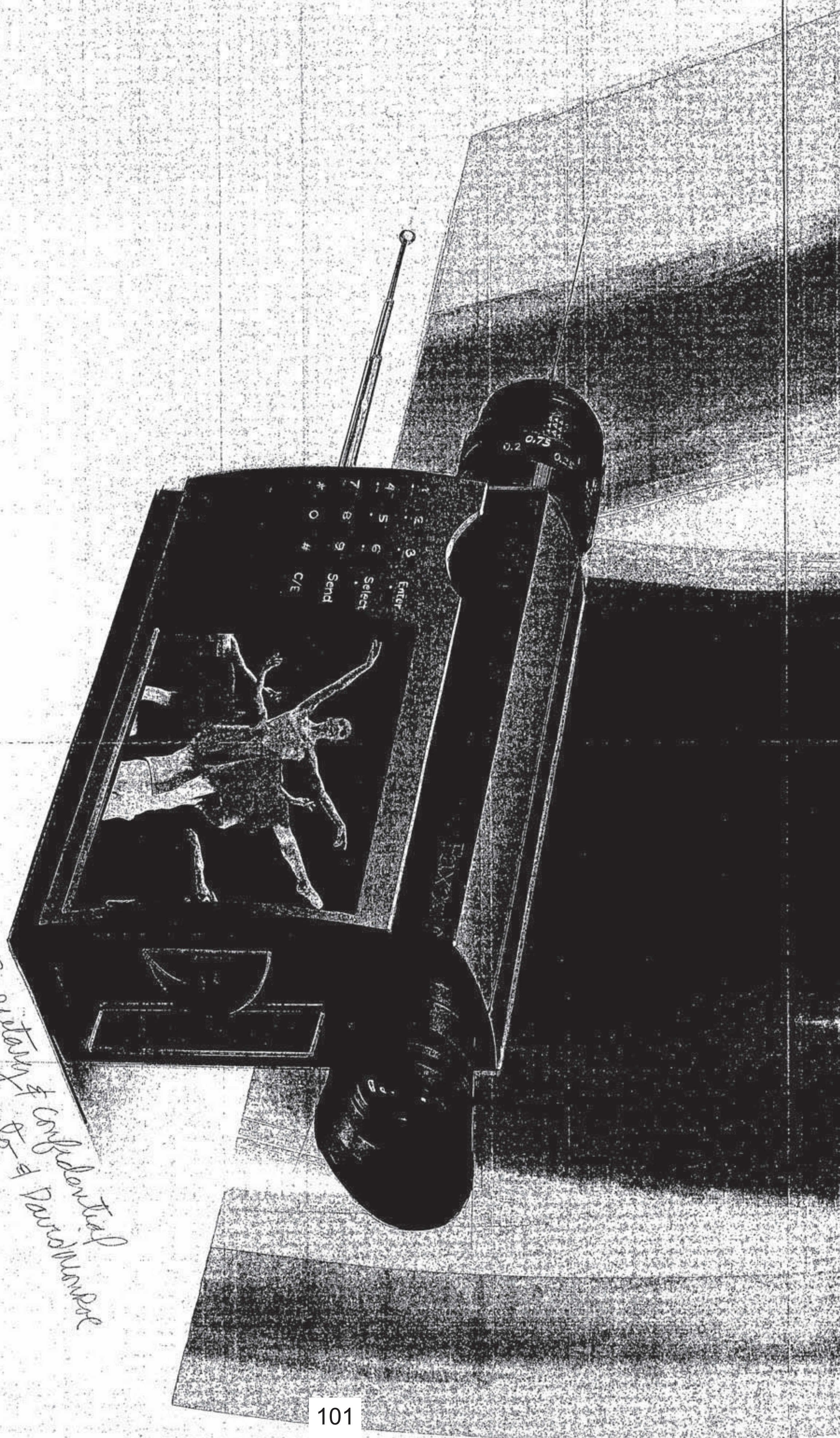
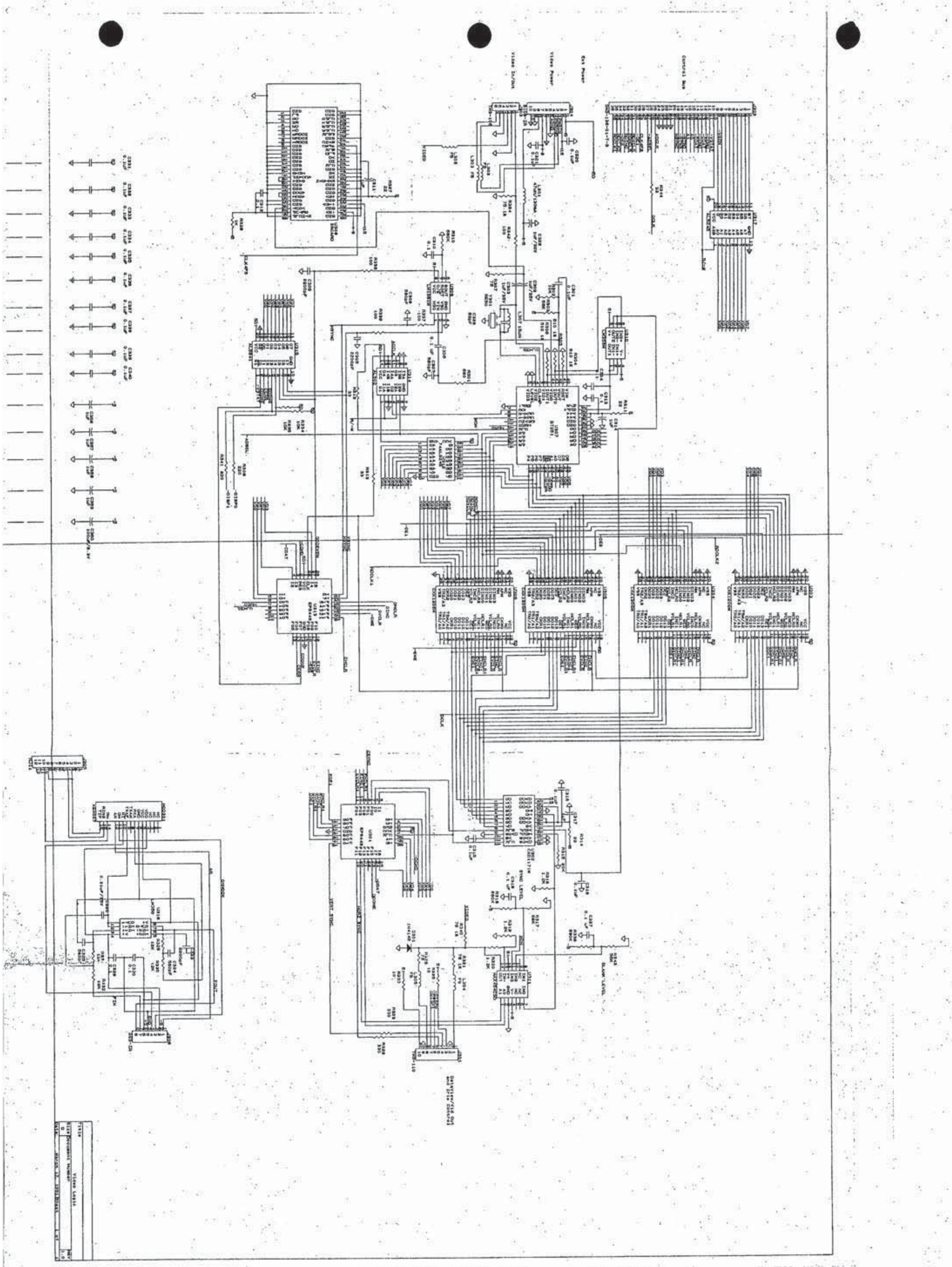

Freeze frame button
8.796"
New camera boards orSONY boards reconfigured, this is a departure from config. A
Telephone microphone
Red line indicates minimum package envelope
4.416"
1.554"
2.847"
Liquid crystal display
Proprietary and confidential to David Monroe, John Frassanito. November 10, 1990.
John Frassanito & Associates
Client
Date
Project

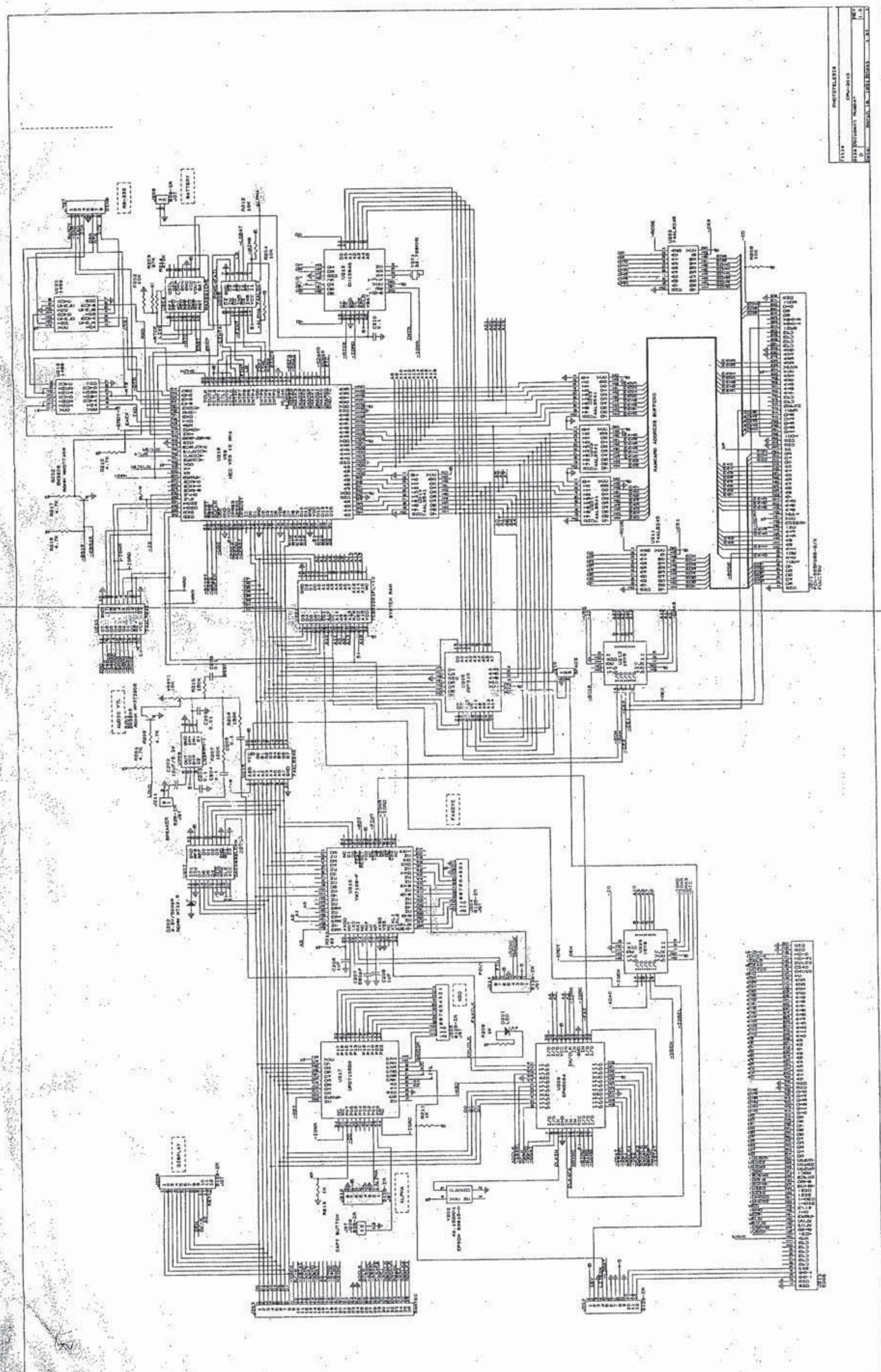
EXHIBIT 9



Proprietary & Confidential
John Ercosanto & David Monroe
Jan 1, 1991

EXHIBIT 10





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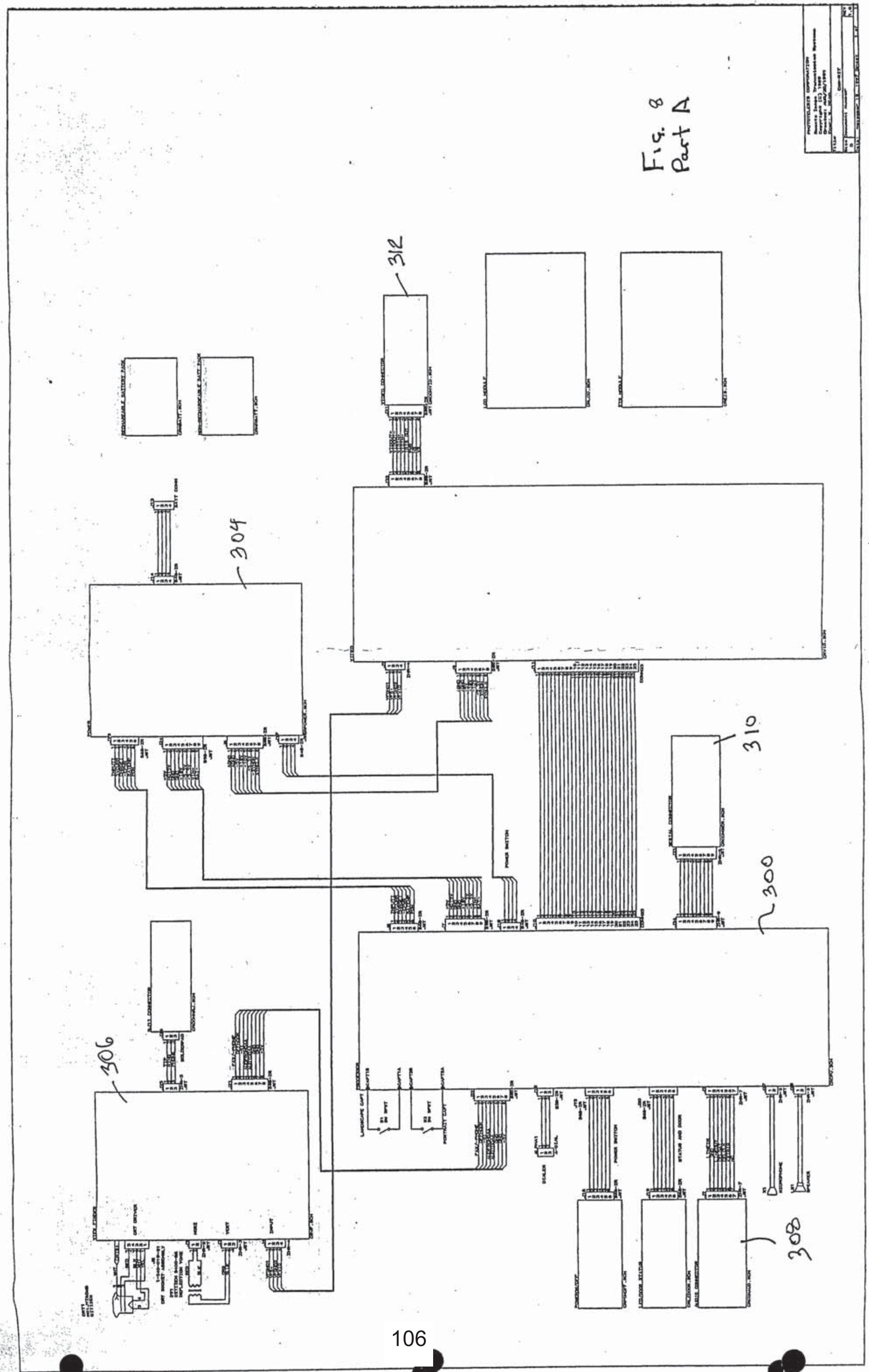
Fig. 8
Part A
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308
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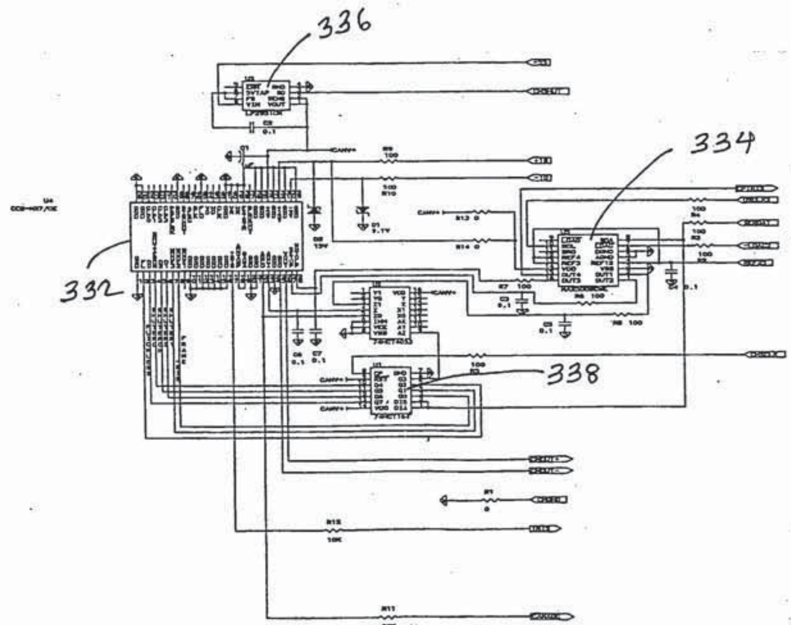
312

CAMERA MUST BE ROTATED SUCH THAT PIN 1 IS UP

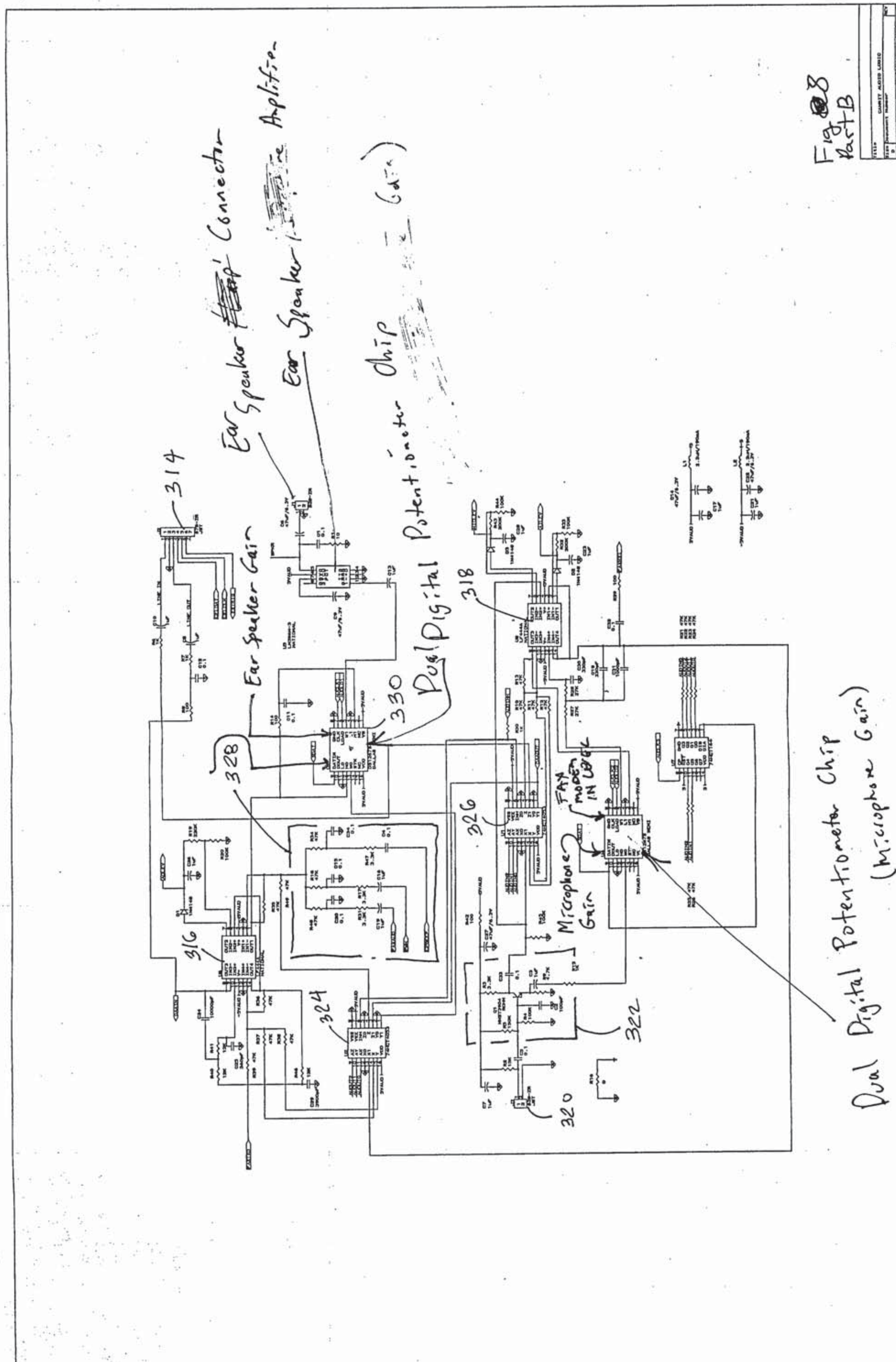


Other early Schematics dated prior to reference date.

(from 1992)

Fig. 8 Part C

Title CAMERA


Ear Speaker Connector
Ear Speaker Amplifier
Dual Digital Potentiometer Chip
Ear Speaker Gain
Dual Digital
314
318
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FAX MODEM IN LOCK
Microphone Gain
Dual Digital Potentiometer Chip
(Microphone Gain)
Fig 8
Part B

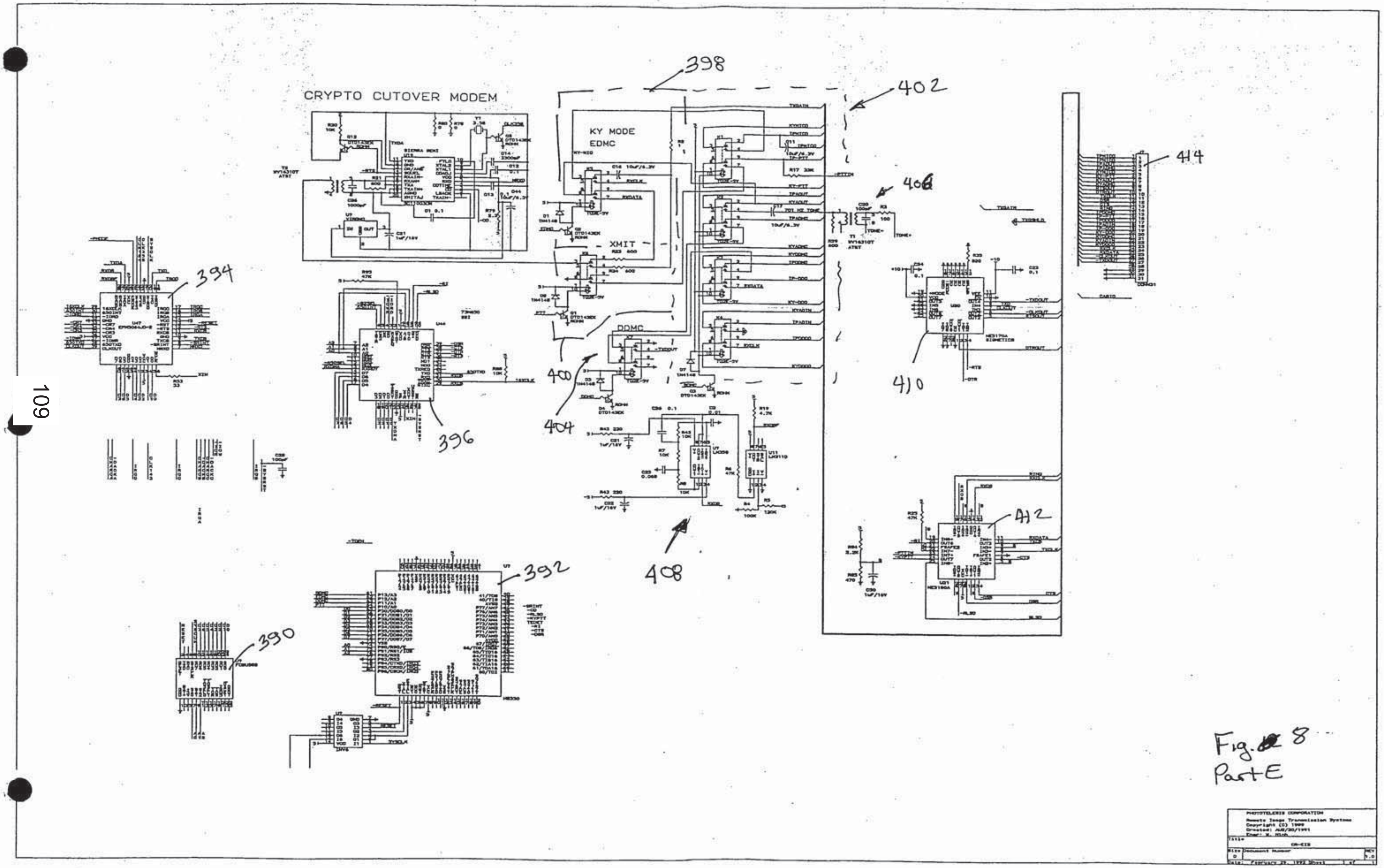
CRYPTO CUTOVER MODEM
KY MODE
EDMC
XMIT
DDMC
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Fig. 8
Part E

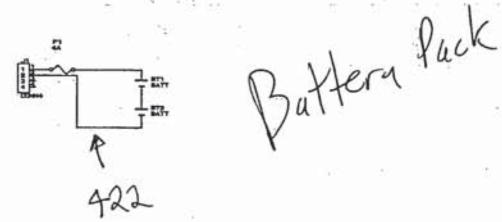

Fig.
Part H

PHOTOTELESIS	
Title: CAN KIT NON RECHARGEABLE BATTERY	
Size / Document Number	REV 1.0
Date: February [illegible] Sheet 1 of 1	

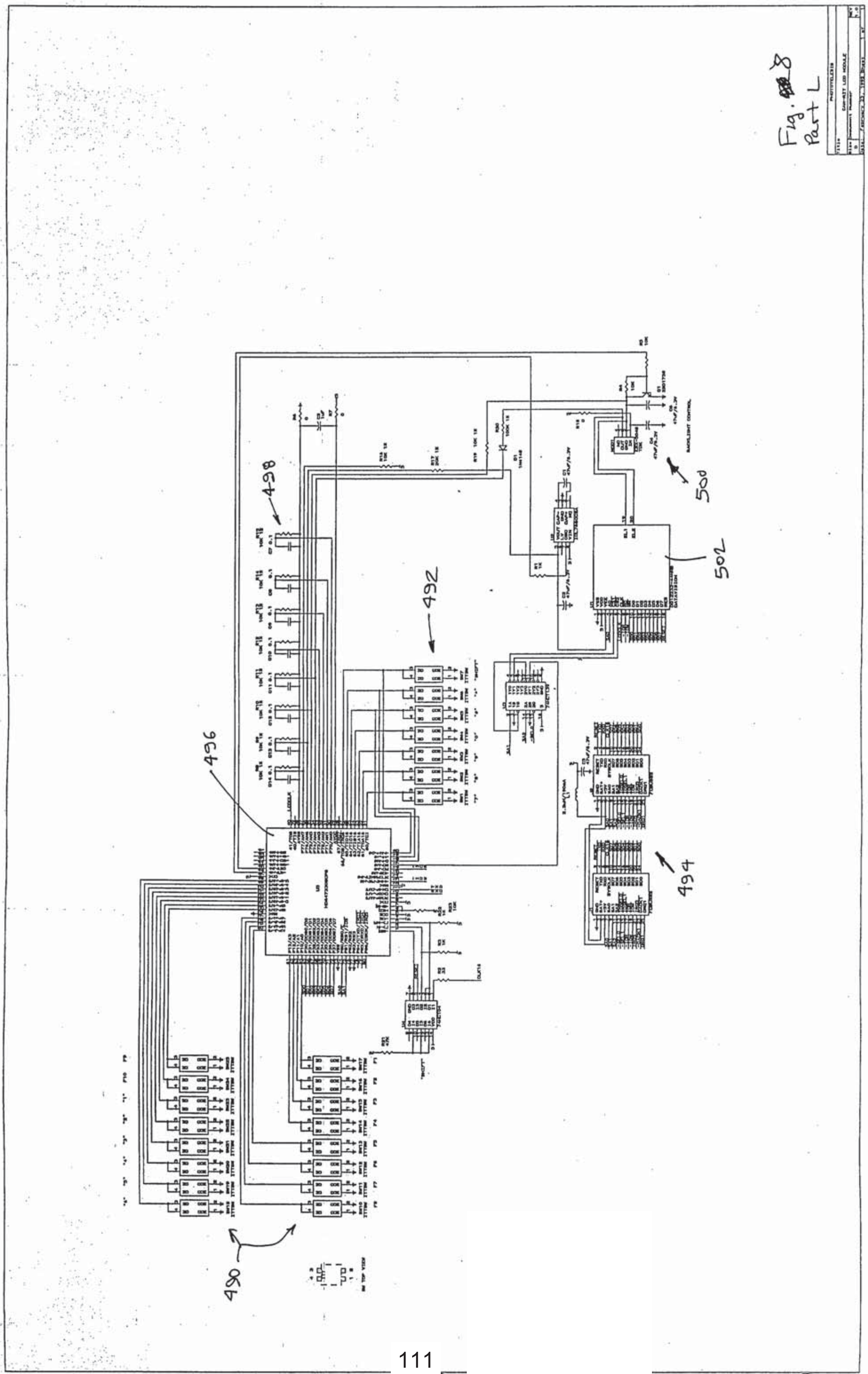

Fig. 8
Part L
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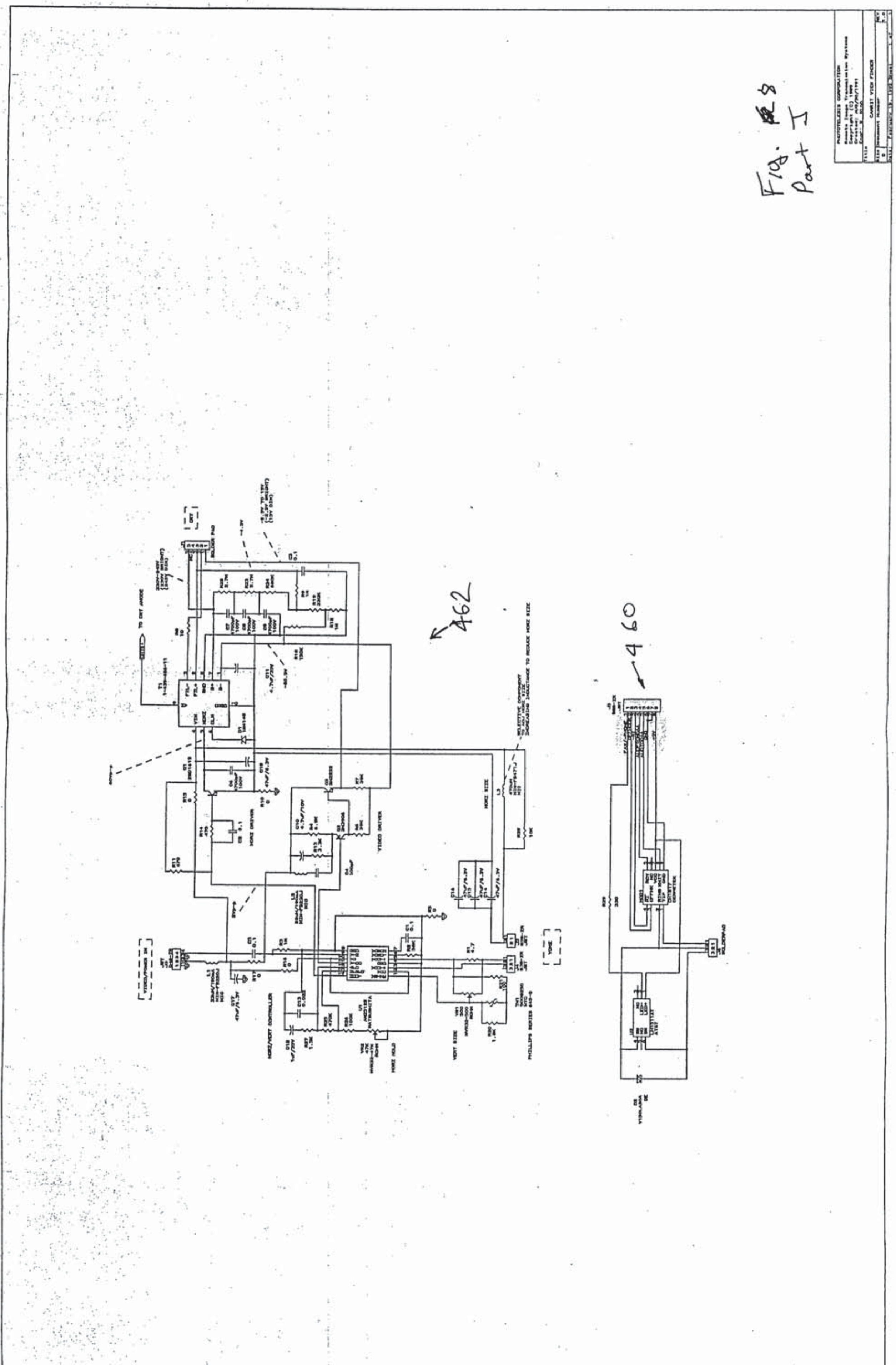
Fig. 8
Part I
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460

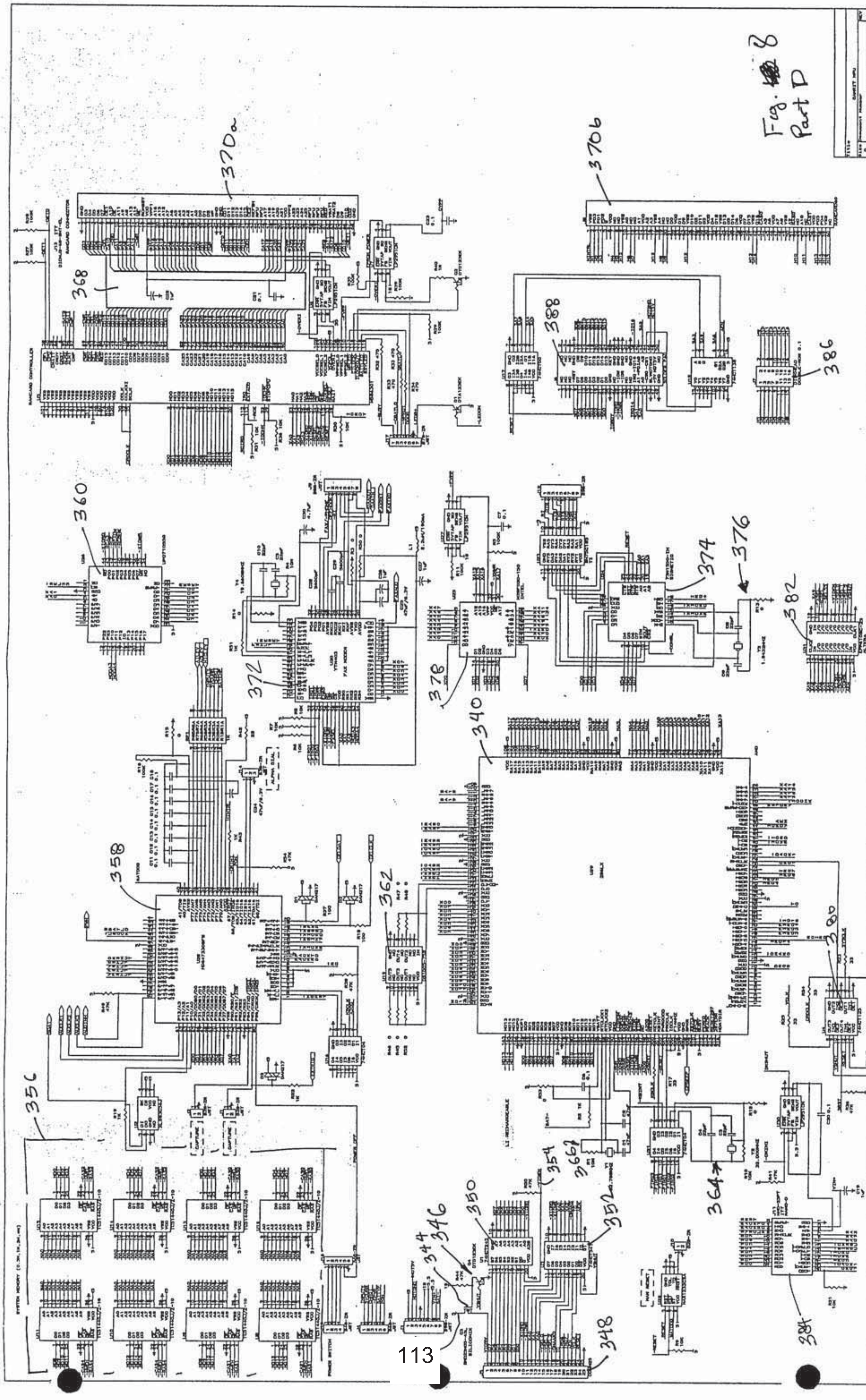
Fig. 8
Part D
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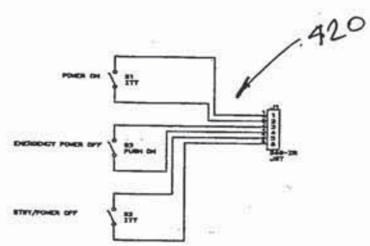
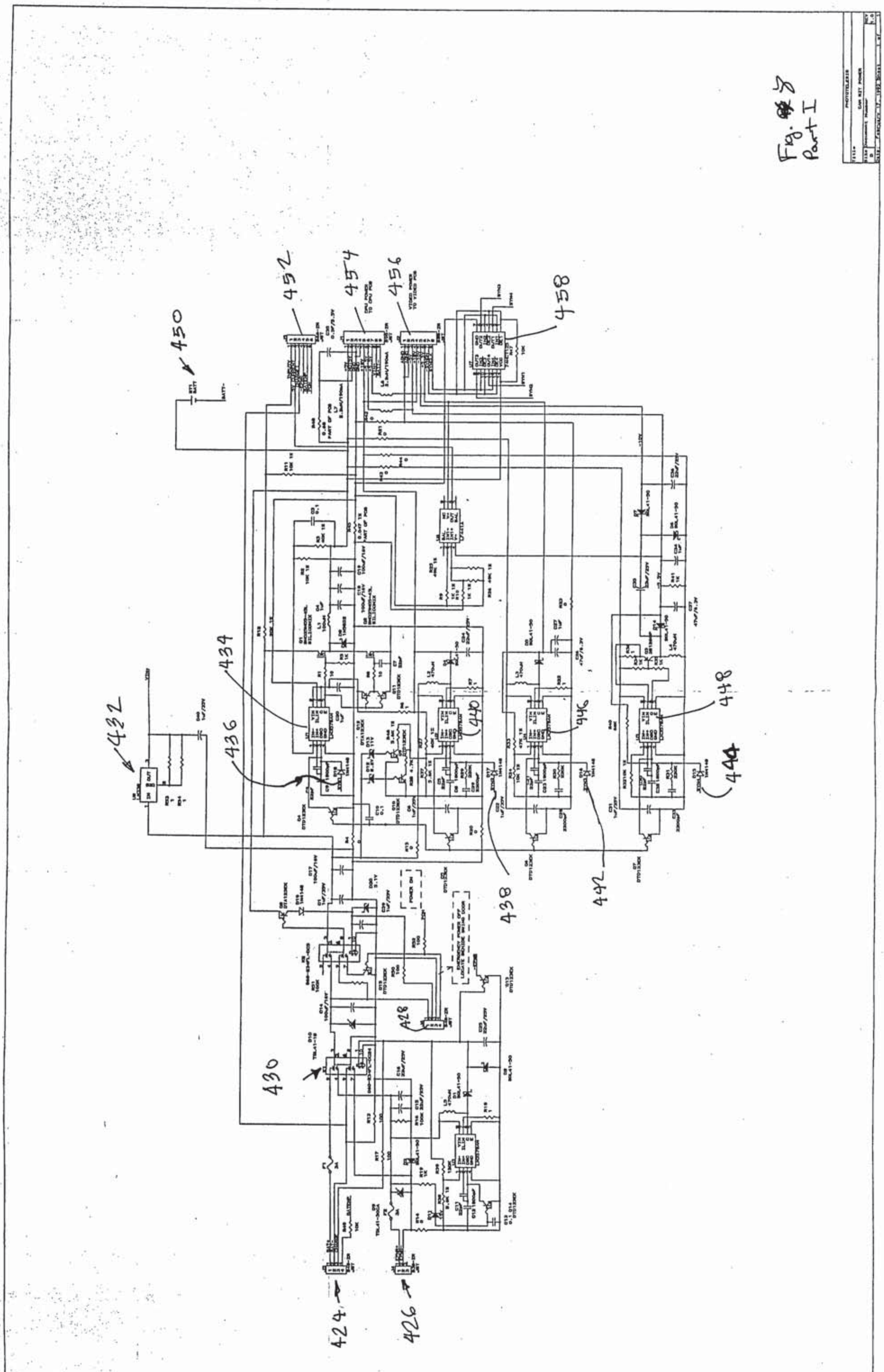


Fig. 8
Part G

PHOTOTELESIS CORPORATION Remote Image Transmission Systems Copyright (C) 1989 Created: AUG/30/1991		
Title CAMKIT POWER ON/OFF PCB		
Size D	Document Number	REV 1.0
Date: February 23, 1992	Sheet 1 of 1	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Part I

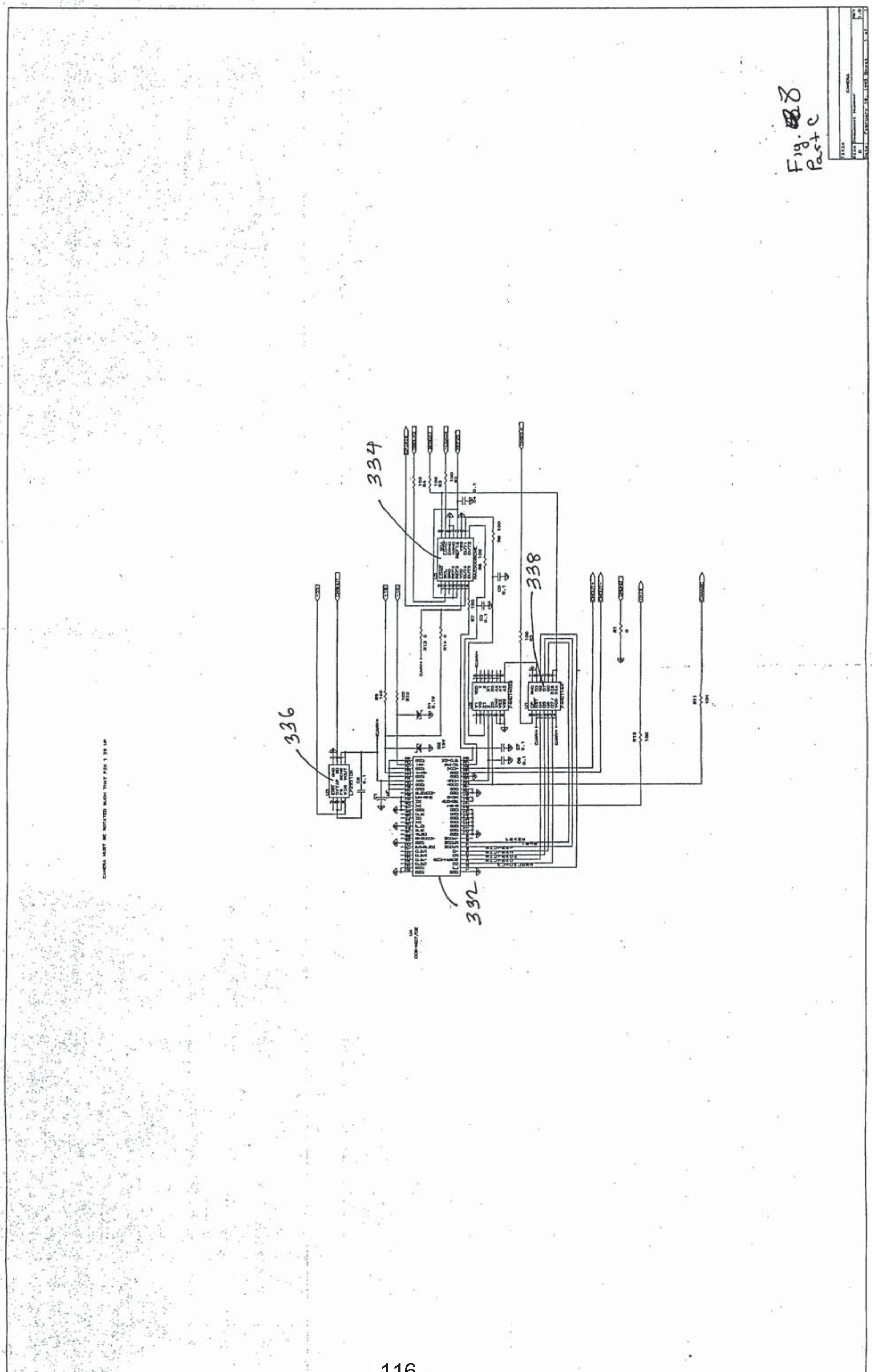
Fig. 8
Part C
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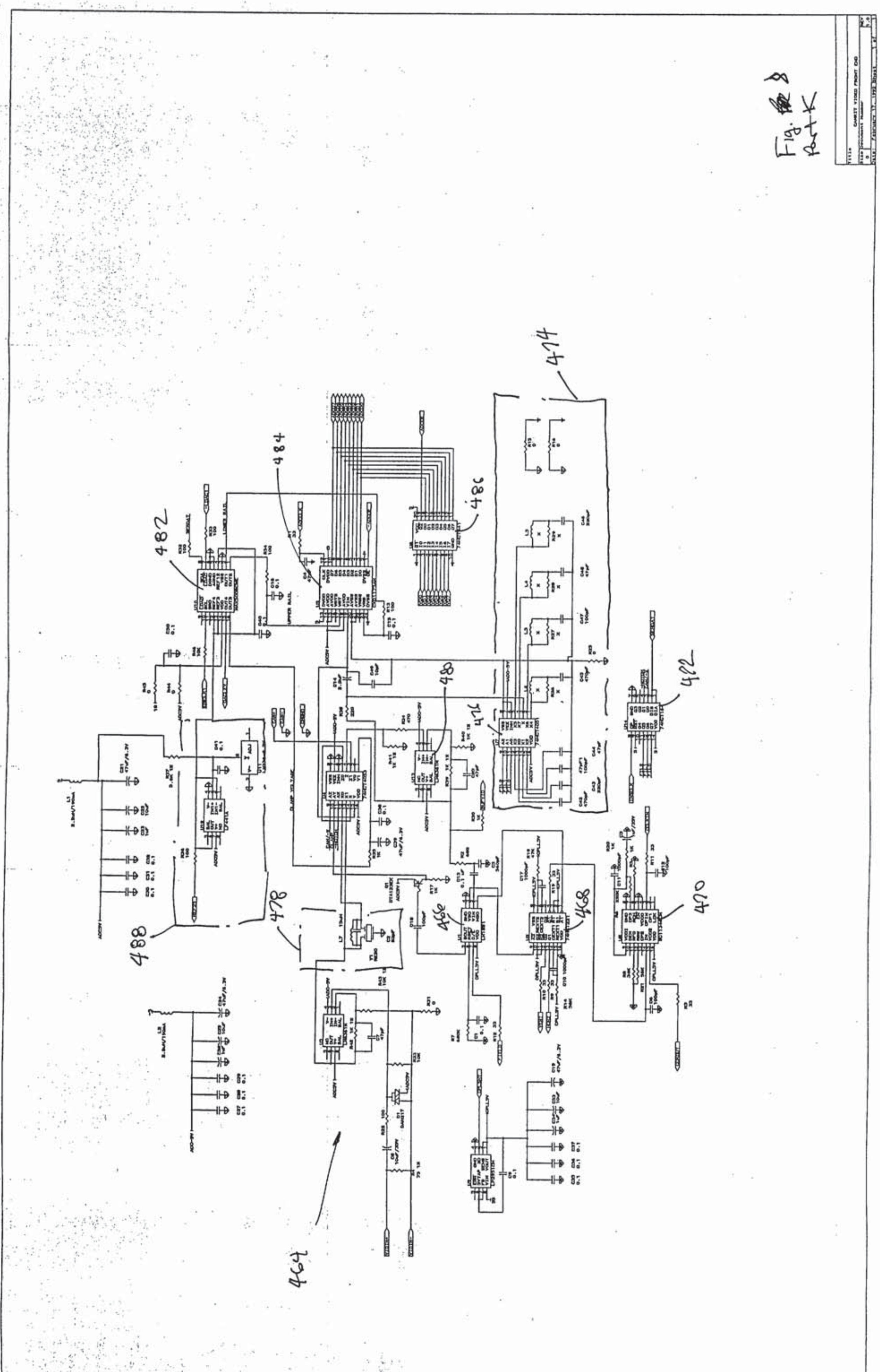

Fig. 8 Part K

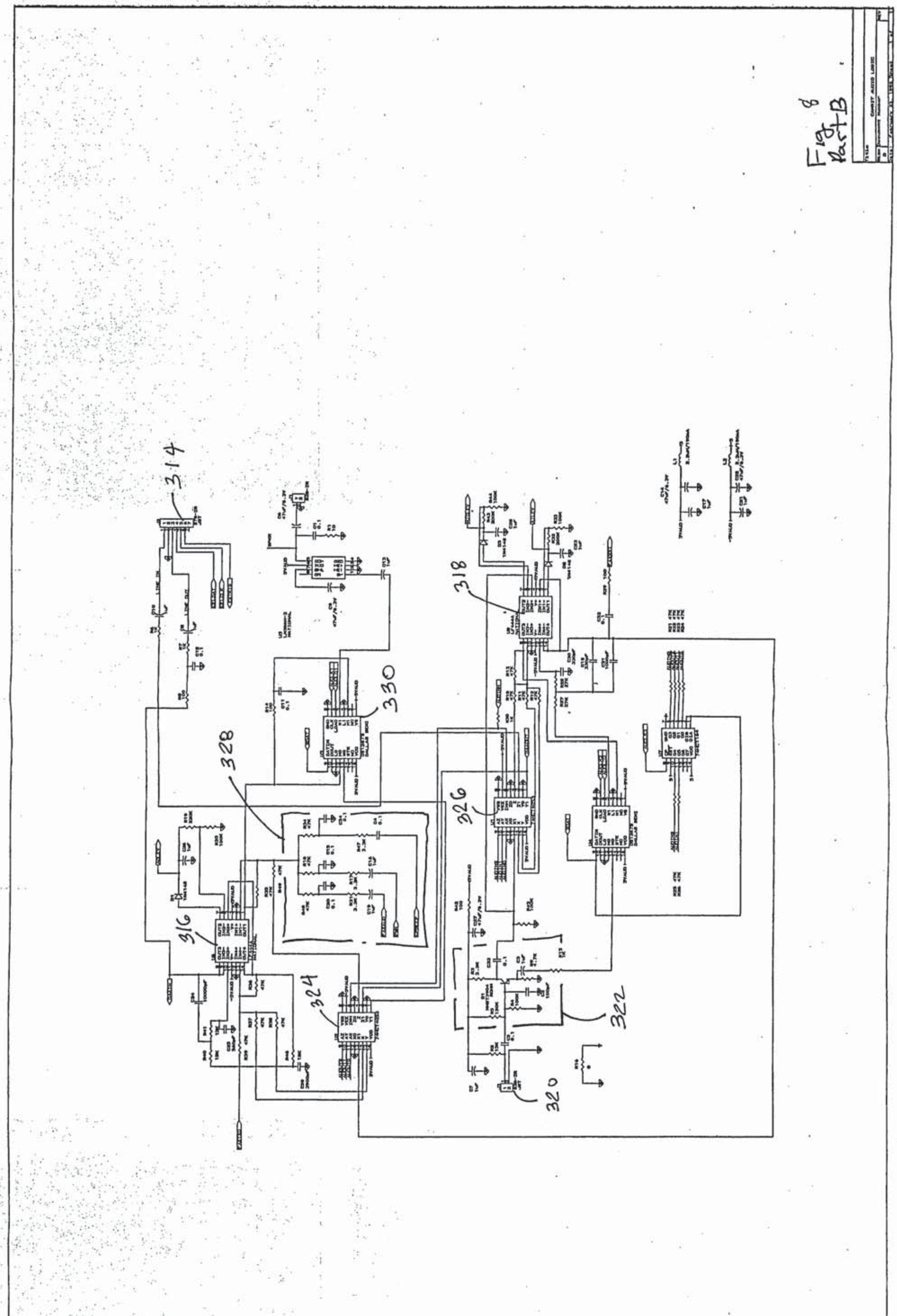
Fig 8
Part B
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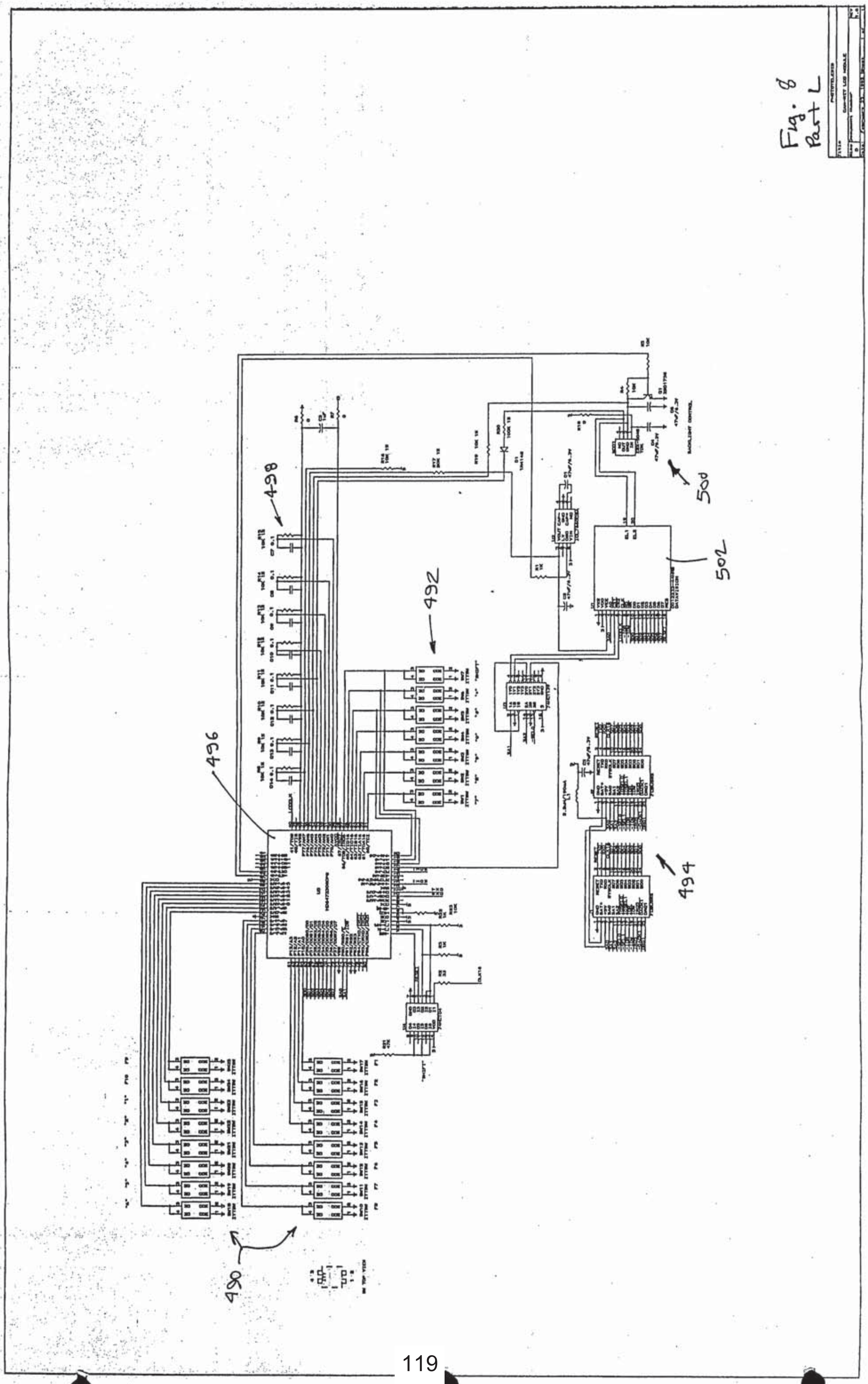

Fig. 8 Part L

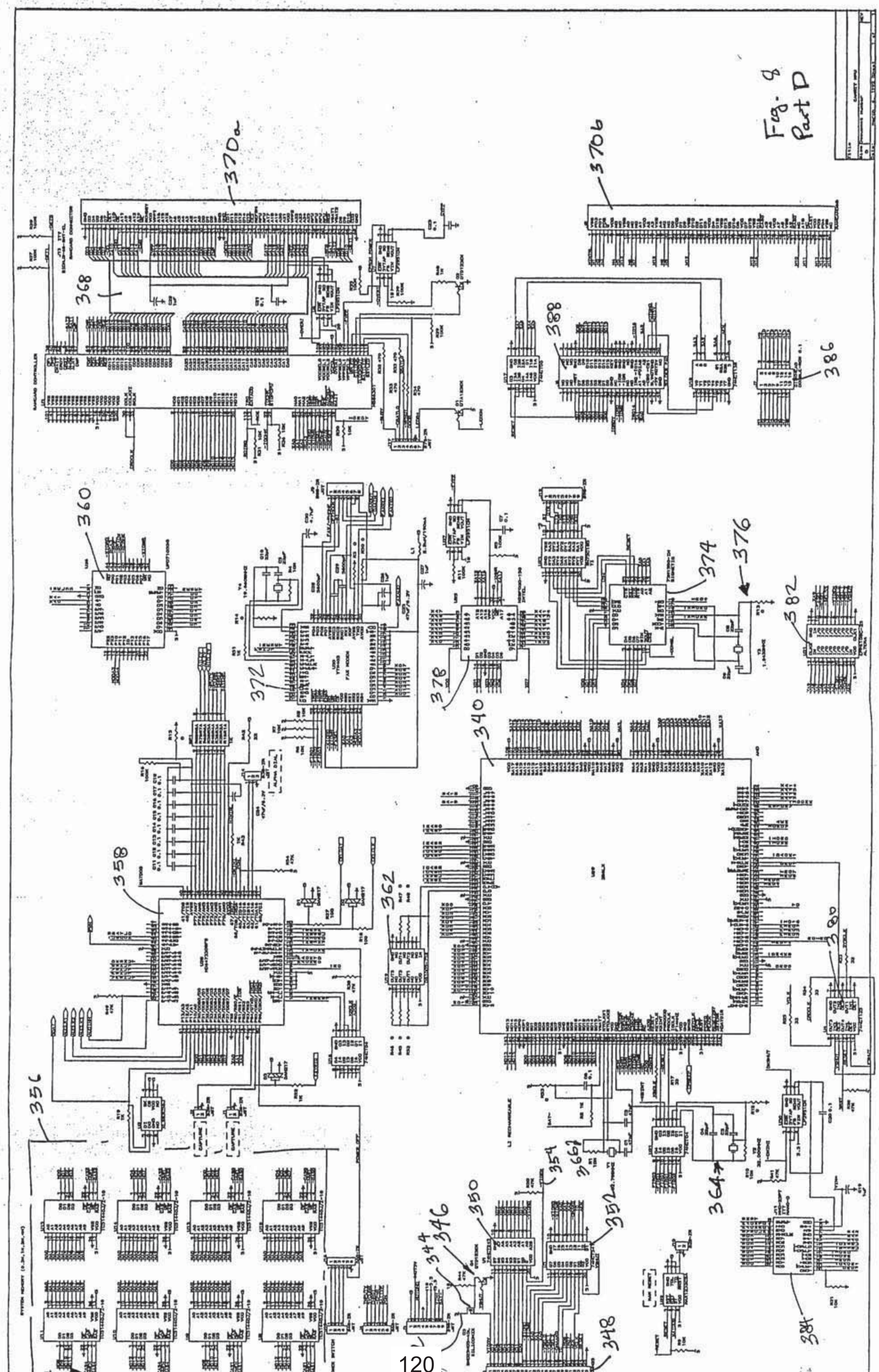
Fig. 8
Part D
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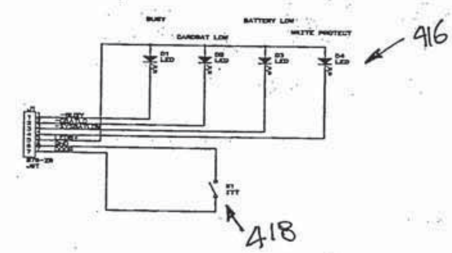

Fig. 8
Part F

PHOTOTELESIS CORPORATION
Remote Image Transmission Systems
Copyright (C) 1990
Created: AUG/30/1991

Title
CAMRIT STATUS AND DOOR STATUS

Size	Document Number	REV
B		1.0

Date: February [illegible] Sheet [illegible] of [illegible]

EXHIBIT 12

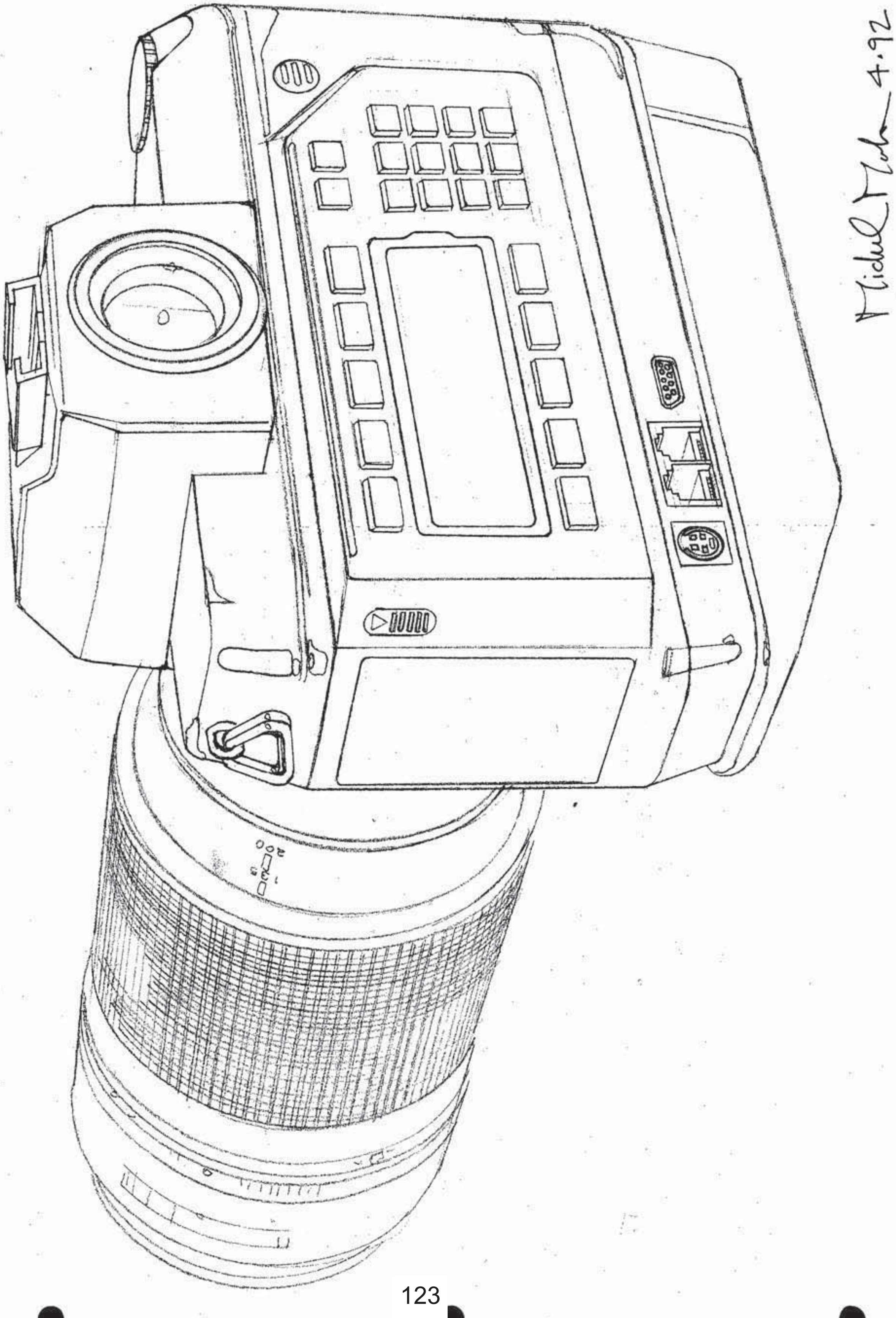

EXHIBIT 13

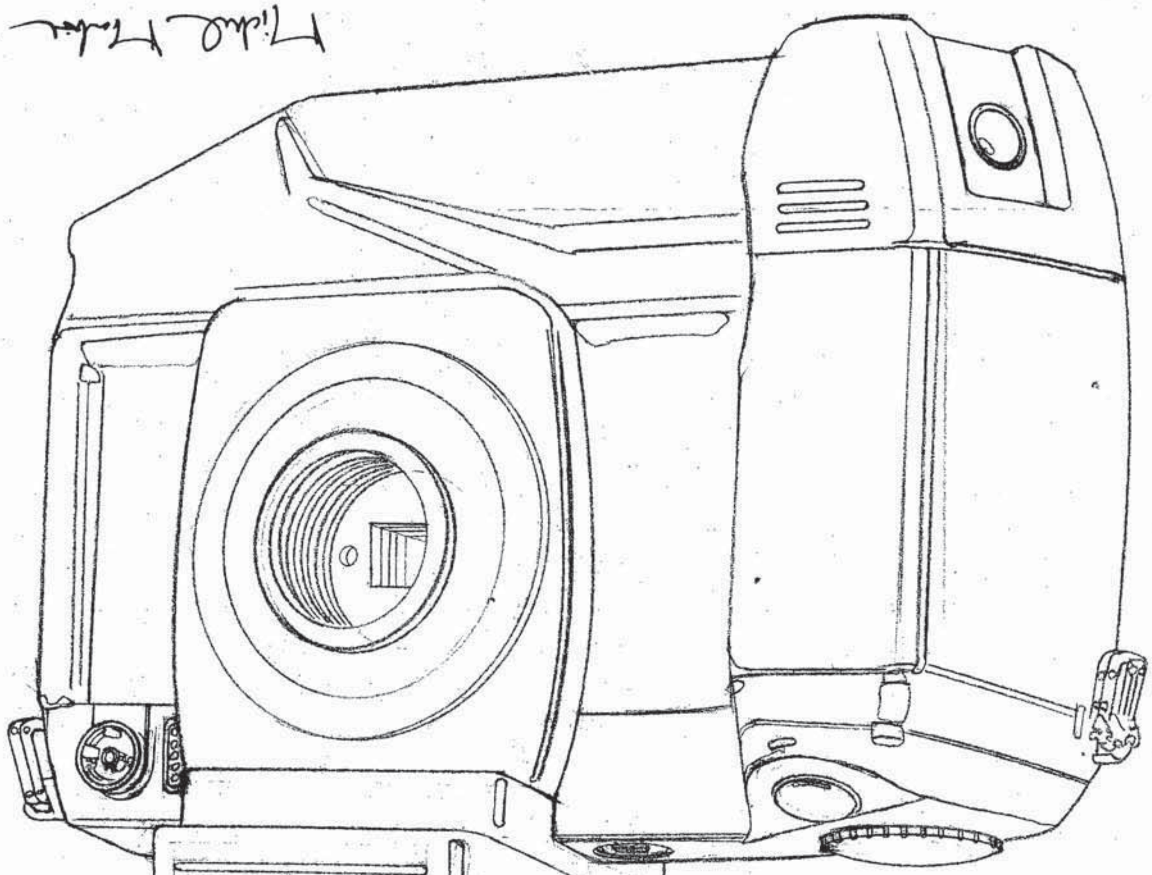

EXHIBIT 14

TEXAS INSTRUMENTS
PHOTOTELESIS

Restriction on Disclosure and Use of Data

This Proposal includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed in whole or in part for any purpose other than to evaluate this proposal. If however, a contract is awarded to this offerer as result of, or in connection with, the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use the information contained in this data if it is obtained from another source without restriction. The data subject to this restriction is contained in this file.

Tres Ellis, Director of Business Development
Texas Instruments, PhotoTelesis

Date: November 2, 1995

PHOTOTELESIS
a Business of Texas Instruments

November 3, 1995

Harry Reves
Engineering Research Facility
Building 27958A
Quantico, VA 22135

Dear Harry,

PhotoTelesis, a business of Texas Instruments, is pleased to provide you with the attached unsolicited Micro-RIT™ proposal.

PhotoTelesis is excited about the opportunity to provide your organization with a state-of-the-art miniaturized image transceiver. If you have any technical questions, please feel free to call Mr. Randy Hoeffer or myself, any financial or contractural questions can be directed to Mr. Tres Ellis.

Sincerely,

David A. Monroe
General Manager

c: Chuck Taylor
file
Enclosures

700 Lincoln Center 7800 IH-10 West San Antonio, Texas 78230 (210) 349-2020

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SECTION 1

EXECUTIVE SUMMARY

MicroRIT™ Proposal

2 November 1995

EXECUTIVE SUMMARY

This unsolicited proposal describes a state-of-the-art image transmitter that is specifically designed for field agent applications with handheld and vehicle mounted digital/secure radios. The MicroRIT image transmitter will capture and transmit high quality monochrome or color images over typical radio circuits, such as the Government Saber Secure Radio on the B-Radio net or commercial cellular phone circuits. The MicroRIT is unique because it can transmit a high quality image in ten to twenty seconds from a unit that is small, low power, and *low cost*. This unique capability is currently unavailable and is crucial for field law enforcement applications.

This MicroRIT miniaturized image transmitter proposal is submitted by PhotoTelesis, a Business of Texas Instruments Incorporated. The PhotoTelesis group is a world leader in Tactical Image Transmission technology, and Texas Instruments (TI) is a world leader in Digital Signal Processing technology and Micro Electronics technology. The proven track records and technology bases of the PhotoTelesis/TI combined team places this technically challenging program well within reach.

1.0 The PhotoTelesis Organization Background:

PhotoTelesis has a 10 year history of specialization in Government tactical image transmission. PhotoTelesis is the leader in tactical transmission of monochrome or color imagery, captured from either television or digital cameras over Government secure radios, Government satellite circuits, and commercial cellular and satellite radios.

The company has installed more than 1000 systems within the Army, Navy, Air Force, Special Operations, Federal Law Enforcement, and Intelligence groups. These systems have been used in classified and unclassified operations. The PhotoTelesis name has become well known as the leader in the tactical image transmission field.

The PhotoTelesis comprehensive product line provides users with a full complement of hardware and software, to support operation from various platforms, including:

- ⇒ Man Portable Applications
- ⇒ Covert Operations
- ⇒ Aircraft Platforms
- ⇒ Ground Vehicle Platforms
- ⇒ Portable Base Stations
- ⇒ Fixed Base Stations

The tactical communications functions of the PhotoTelesis products include:

⇒ Distribution of images, text and data over all government secure voice bandwidth circuits.

⇒ Database Archiving of stored images and text data.

⇒ Traditional Data Processing activities in MS-DOS and Windows

⇒ Interoperability with Government NITFS 2.0 "National Imagery Transmission Systems"

Distinctive Competence

A unique blend of Independent Research and Development, combined with commercial off-the-shelf technology, has allowed PhotoTelesis to offer products with innovative designs and superior performance at competitive prices. The modular construction of products allows easy technology insertion of hardware and software enhancements lowering life cycle costs.

The success of PhotoTelesis can be attributed to a commitment to service and providing solutions to our customer problems. Our reputation has been earned by focusing our expertise in the following key areas:

• **Reliable/Dependable Transmission of Data.** Imagery and Data can be sent from a harsh tactical environment where air time for transmissions is limited. Users depend upon their equipment to transmit images and data reliably over wideband SATCOM or narrowband communication channels. To compensate for natural and man-made noise, PhotoTelesis' proprietary protocols incorporate error correction techniques and compression algorithms that provide both efficient and reliable transmissions. These message and image transmission protocols are specifically designed for noisy narrow-band radio communications, and are currently heavily used in operations involving Command, Control, Communications, and Intelligence (C4I) applications.

• **Ease of Operation for the User.** The operational simplicity and versatility of both hardware and software design allow non-technical user compatibility with a wide range of cryptologic devices, secure telephones, and radios. The systems are designed to be automatically configured by cable connections reducing hardware damage by operator error. The equipment is built with user friendly interfaces (GUI) or a menu driven screen.

• **Products for Various Platforms.** The company has focused on customer requirements to develop, with IR&D funds, products used on various platforms, i.e., vehicle, aircraft, and man-portable units. This has resulted in building a repertoire of off-the-shelf products for Aircraft, Special Operations, and Law Enforcement.

• **Rapid Product Development.** PhotoTelesis has reduced the time and cost of product development, from product definition through design, development, and pilot production. This is accomplished by significant technology re-use, in conjunction with strong specialized skill sets of the engineering team. The majority of the PhotoTelesis products have been sold as Non-

Developed-Items on Indefinite Delivery Order or Fixed Priced Contracts, thus reducing customer financial and technical risks.

1.1 Texas Instruments (TI) Incorporated Background:

Texas Instruments has diverse capability in micro-electronics, Government, commercial, and consumer products. TI is a high technology company with sales or manufacturing operations in more than 30 countries; a major supplier of integrated high performance EO based fire control systems, high performance processors, thermal sensors, missile systems, and radar components to the U.S. Department of Defense (DoD). The MicroRIT program will utilize several key TI capabilities:

TI is a world leader in Digital Signal Processing (DSP) technology. The DSP is key to the MicroRIT's small size, low power, and low cost. Commercial technology and the capability for high volume production also provide opportunity for significant unit cost reductions, allowing for *extensive* deployment of the technology at a *very affordable* cost.

1.2 The Combined PhotoTelesis/Texas Instruments Team:

On August 18, 1995, PhotoTelesis Corporation was acquired by Texas Instruments Incorporated. PhotoTelesis' expertise with tactical image transmission combined with the financial strength of Texas Instruments offer our customers innovative and cost effective tactical imaging product solutions.

PhotoTelesis and Texas Instruments have a two year continuing history of cooperation and teaming on other Government imagery programs, including the US Army Hunter Sensor Suite program and the Lightweight Video Reconnaissance System (LVRS) program.

PhotoTelesis/Texas Instruments is excited about the opportunity to provide new state-of-the-art capability through more closely integrated efforts on the part of all team members.

1.3 The Program Background:

Tactical Imagery has proven to be the most efficient and quickest means to distribute critical information to the decision maker. Imagery in the field can provide agents with near-real time secure surveillance that improves their situational awareness, suspect identification capability, and thus, reduces allocation of limited personnel resources. Unfortunately, both military and commercial products used for transmission of Tactical Imagery are currently unsuitable for law enforcement because the military products are too large and too expensive, and the commercial products are too large and are not capable of operation over Government tactical radio circuits.

Current generation Remote Image Transceivers (RIT's) manufactured by PhotoTelesis are in operation over the Motorola digital radio systems owned by the Government for the purpose of transmitting secure (encrypted) imagery from mobile platforms to fixed sites.

Still Imagery is being transmitted using the SABER II, with the Secure INDICTOR option, at 12Kbps. A primary requirement of maintaining minimum data transmission times and a quick restoration of the radio-to-voice communications have been met in product demonstrations of this capability. At a recent test, using the PhotoTelesis man-pack TAC-RIT, monochrome images at a resolution 592 by 440, 8-bit pixels were transmitted in 8 seconds using Wavelet compression, and 21 seconds using industry standard JPEG compression.

This proposal describes an engineering program that miniaturizes the PhotoTelesis current capability into a very small, covert, low power Remote Image Transmitter (MicroRIT) *specifically* designed for agent use. The primary goals for field agent use are:

⇒ Very Small Size (Cellular phone size)
⇒ Low Power (2-4 watts)
⇒ Simple User Interface
⇒ Fast Transmission Time
⇒ Monochrome or Color Use

SECTION 2

TECHNICAL APPROACH

TECHNICAL APPROACH

Until the advent of small, low power digital signal processor (DSP) semiconductors, the MicroRIT was unfeasible. Now, however, such DSP's allow the design of very small, but highly sophisticated data acquisition and processing devices. In fact, the DSP component is the heart of the MicroRIT, controlling all aspects of its operation from video acquisition, to image compression, to tactical communications protocol, to user interface.

A digital signal processor, or DSP, is a special type of microprocessor that has been highly optimized for numerical computations (namely digital signal processing) which involve long sequences of multiplication and addition operations. Digital filters, spectrum analyzers, and data compression algorithms fall squarely in this category. While the DSP is not often used as a generalized host processor (such as an 80486, Pentium, or 68000), it can certainly be used as a host CPU. Because of the particular hardware optimizations that were implemented for digital signal processing, a DSP tends to have smaller address spaces (under 1 megabyte) and less support for string-oriented operations (for handling character strings). However, several DSP variants can quite easily be used as an embedded controller and signal processor - obviating the need for two separate processors. This often simplifies the hardware design and interprocessor communications mechanisms.

The MicroRIT was conceptualized specifically with a DSP as the system controller in mind to reduce the size and power requirements of the unit. In addition, to controlling the overall system function, the DSP is responsible for controlling the digitization of video, the compression of this captured video, and the communications protocol and link-layer interface. These functions would occur serially. That is, it would not be possible to be capturing video while sending a compressed image at the same time. This one-at-a-time restriction is due to two problems. The first is the limited amount of multi-tasking support in the DSP architecture. Few DSP operating systems are available that support preemptive multi-tasking. The second is the limited address space of the DSP. Many DSP's have a fairly limited address space - often under 64K words! This will require that both the codespace and the dataspace be page-swapped. Page-swapping essentially means that only one software function can be active at a time - which implies the serial nature of the major functions.

2.0 Capturing Video

A conventional frame grabber contains a great deal of circuitry necessary for demodulating the video signal, identifying and triggering off the vertical sync signal, stripping the sync signals from the image data, digitizing the demodulated data, and storing it in a dual-ported RAM. This is required because the host processor has neither access to the raw video signal, nor the processing power to execute these functions in a real-time fashion. The DSP used in the MicroRIT approach, will however, be controlling the video digitization while itself does the vertical sync identification. External analog-to-digital converters (ADC) will still be used to digitize the video signal, rather than using any onboard ADC capabilities of the DSP chip, because most DSP ADC's are not fast enough to digitize at video rates (at least those DSP's that can meet our low-power requirements). Another subtle point about this approach is that video need only be digitized on user demand. This implies that the video ADC circuitry only has to be energized for 1-2 frame times to acquire the image. Video ADC's can consume several watts if left free running. The non-requirement for video output allows this digitization-on-demand approach that should significantly help reduce size, weight, and heat dissipation, as well as extend battery life.

2.1 Video Demodulation

A color video signal, in particular a composite color video signal, carries the luminance and color (chrominance) information in different frequency bands. Usually, an analog filter is used to separate these signals into two analog channels that can then be digitized separately. In order to save power and space in the MicroRIT, we will perform this demodulation in software running on the DSP after a frame's worth of video data has been captured. Even an S-Video signal carries two color channels on the chrominance signal (which is physically separated from the luminance channel). The same type of *software* demodulation will be done on the S-Video chrominance channel for S-Video. The video demodulation is performed after a frame acquisition, not during. This is significant because it restricts the MicroRIT to performing system functions in a serial fashion. That is, one high level function after another is performed by the central processor (the DSP). There is no multitasking of system functionality in the MicroRIT. This is due in part to the lack of multitasking DSP operating systems as well as the somewhat limited addressing capability of today's DSP's (under 1 megabyte of codespace). Thus, after the user specifies that an image is to be acquired, the video digitization circuitry powers up, acquires a frame of video data, and passes control to the video demodulation software which then separates luminance from the color signal by a digital filter.

2.2 Image Compression

After the image has been digitized, separated, and demodulated by the system DSP, it will be compressed with either the JPEG or PhotoTelesis wavelet image compressor. This choice is user selectable (via the set of buttons and alphanumeric display). The wavelet compressor is well suited to the S-Video type of input since it was designed to work on L/Cr/Cb video data. Like all other PhotoTelesis implementations of the wavelet codec, the user will be able to select several choice of compression ratio and/or "quality". PhotoTelesis is constantly improving its image compression technology. These improvements affect compression/decompression time and image quality. They also affect compression features such as, quality specification (Q-Factor), multiresolution compression, and industry standardization. The contractor will strive to incorporate image compression improvements into the MicroRIT product, subject to the program schedule.

2.3 Image Storage

There will be enough battery-backed SRAM within the MicroRIT to hold 40 wavelet compressed color images. These can be held on-board until downloaded to a host computer via an RS-232 port. Originally, it was conceived to use a PCMCIA SRAM card for this image storage. However, the physical size of the mechanical PCMCIA slot and the extra interface circuitry was not justified. If the images are stored within the MicroRIT, the user will have to bring back something, be it the MicroRIT or a PCMCIA card, in order to offload the images to some sort of Base Station unit. Thus, the SRAM memory was chosen over PCMCIA.

2.4 Communications

The MicroRIT will be able to connect to all standard COMSEC equipment including STU-III's, SINCGAR's, SABER and RACAL (MHSR) radios, KY-57, KY-58, and Sunburst. The DSP processor will run the PTAC and PTAC-2 (required for file pull capability) protocols in order to be backward compatible with existing PhotoTelesis equipment. The DSP will also directly control all COMSEC control lines (PTT, BDMC, etc.) as well. The DSP and some glue logic will essentially replace the original EIS card of the PhotoTelesis ACT product line.

Note that this version of the MicroRIT will not include the NITFS TACO-2 protocol. There is an assumption that the MicroRIT will be communicating with other PhotoTelesis equipment (i.e., Base Stations) which do have the TACO-2 capability.

Note that the automatic voice/data cutover modes for the KY-57 and KY-58 will not be implemented. Manual data switching will be used.

2.5 User Interface

The user will be able to interface to the MicroRIT two ways: 1) the set of onboard pushbuttons, 2) an RS-232 cable linking the MicroRIT to a host computer. There will be five (5) buttons on the MicroRIT to control normal operation of the system. There will also be an alphanumeric display for status and menu information. The functions on the MicroRIT will include power (on/off), capture, send, and menu. The menu will allow the specification of compression type, compression ratio, protocol, call sign information, send/hold modes, etc.

The RS-232 interface to the MicroRIT will be used for 3 functions: 1) Update system software (stored in FlashRAM on the MicroRIT), 2) download configuration information to the MicroRIT (call sign lists, compression defaults, etc.), and 3) download compressed/stored images from the MicroRIT to a workstation (such as an MIT-301). This will be a very simple RS-232 interface with a subminiature connector on the MicroRIT to the standard 9-pin COM connector on a PC.

2.6 Hardware

2.6.1 Packaging. The MicroRIT is designed to utilize standard snap on cellular telephone batteries. Several battery sizes and capacities are available from telephone retail outlets. The MicroRIT's overall size approximates that of a hand-held cellular flip-phone. High capacity battery life is estimated at 1 hour of full operation, with standby time approaching 30 hours.

The initial design and packaging will be implemented with an aluminum machined case. The finish will be black anodized for cosmetic finish. High volume applications could be done with a plastic injected molded case, but these costs are not included in the funding proposals submitted. A conceptual drawing is shown in Figure 1. The display and interface panel will allow system status and operational menus to be displayed to the operator. There is a recessed subminature-D connector on the bottom edge of the unit that provides all input/output connections. If this unit is used in embedded system applications, external power can also be provided through this same connector. The connector is recessed to prevent damage to the connector by accidental dropping or stricking other objects. The connector is installed on the bottom edge to provide best comfort to the operator when the cable is installed.

This MicroRIT package design will also include the ability to embed this device in higher capability equipment. Examples include radios, portable video equipment, or other equipment including cameras and radio transmission capabilities. This concept is similar to equipment with font cartridges, game cartridges, etc. The operator interface and display panel will not be included on these embedded applications. Power will be supplied through the external I/O connector.

2.6.2 Hardware Implementation. The MicroRIT architecture is based on the Texas Instruments TMS320 series of Digital Signal Processors. This DSP is the core of the design, with additional components providing the input/output interfaces to the operator, external power source, radios/Cryptos, and external computer links. There is one D-subminiature connector that provides these I/O functions. There are 5 control buttons, along with an alpha-numeric LED display for operator control and feedback status. The Overall block diagram is shown in Figure 2.

2.6.3 Memory. The memory implemented in the MicroRIT consists of low-power Static Rams (S-Rams). These memories are page partitioned to provide both program storage, raw video data workspace, as well as compressed video image storage. The design goal is to provide the capability to store a minimum of 40 images of 32K each in compressed image size. The architecture provides one memory page per image when storing compressed images.

2.6.4 I/O Ports. There are 2 input/output Serial ports incorporated into the design. One is designated for communication over radios, Crypto's, and STU type telephone devices. The other is intended for interfacing to other standard RS-232 computer devices such as Global Positioning Systems, some camera devices, and personal computer links for downloading image data or downloading operating program software. If the system needs to be reprogrammed for different mission requirements, the planned mechanism is to download from any serial computer device, the operating parameters and program software. If the user elects to save images, rather than send them immediately, these saved images could also be downloaded from the internal S-RAM memory via this serial port.

2.6.5 Power Sources. The MicroRIT is powered from either an attached cellular phone compatible battery, or via external power input through the I/O connector. For extended operating times, the external power mode is used. The input DC voltage range is 5.5-8.0 volt.

SECTION 3

COST

COST

The project represents a significant development effort with a medium level of risk. The contractor is keenly aware of the budget constraints and has taken steps to reduce the government's cost. The proposed cost has been reduced by the contractor's program investment of $576K and utilization of the contractor's Image Compression and Communication Software, which was previously developed with IR&D funds.

The development effort is allocated into hardware engineering and software engineering as follows:

Hardware	$661,093.80
Software	$984,492.21
Total Development Effort	$1,645,586.01
Less:Contractor's Investment	($645,586.01)
Cost to government	$1,000,000.00

Upon completion of the project the government will receive 2 prototypes. The production cost per unit is targeted to be $3,000.00-$4,000.00 in lot sizes of 100. Cost reductions are possible by tooling the cage for plastic injection molding based upon higher volumes.

3.0 Schedule

The contractor anticipates the project will require 12 months from inception to prototype delivery. After prototype delivery, unit production could begin immediately. Attached are program schedules for Hardware and Software.

3.1 GFE

The contractor will require two SABRE II radios for testing during the program.

3.2 Personnel

The contractor will assign two Engineering managers and one program manager to this project. Their resumes are attached:

SOFTWARE
Dr. Bruce Mather..................Manager of Software Engineering

ELECTRONICS HARDWARE
Roger Vest............................Manager of Hardware Engineering

PROGRAM MANAGEMENT
Bill Kidd...............................Program Manager

3.3 Attachments:

1. Micro-RIT Technical Specifications
2. Block Diagram
3. Drawing
4. Program Schedule
5. Detail Costs

SECTION 4

PRODUCT SPECIFICATIONS

MicoRIT Functional & Physical Specifications

Video Input:	Color/Monochrome Composite/S-Video 640 x 480 x 16-bit color (8-bit grayscale) 768 x 512
Image Storage:	Onboard flash (or battery-backed SRAM) for 40 + compressed color images (@32K)
Video Output:	None
Audio:	Digitized voice annotation will be provided
Comms:	PTAC (KY-57, Sunburst/STU-III, Sincgars, Saber)
RS-232 Interface: download, etc.)	External GPS receiver, S/W update, offload images, system configuration (call sign
User Controls:	Five (5) buttons - (1) On/Off and (4) controls: On/Off switch, Call Sign Select, Grab Image, Send Image, Settings (scrolls menus)
Display:	5x7 dot alpha-numeric low power green LED's (like cellular phones) One (1) flashing "battery low" LED

* User Controls & Display are optional for embedded applications (i.e., RIT can be built without them)

Power:	2-4 watts @ full operation (idle mode when not doing imaging portion)
Battery:	Internal battery and/or external power 30 hours idle, 1 hour operational Disposables or Rechargeable (like cellular phone)
Weight:	1 pound (plastic) 1.5 pounds (metal)
Size:	1" x 4" x 3" (Hand-Held Cellular Size)
Temperature:	-20° to 50° C

System does only one function at a time:

Grab image	one frame at a time
Color demodulation	
Image Compression	< 5 seconds (to grab, demodulate, and compress)
Store image (40+)	< 1 second per image
Send Image	12Kbit line - 15 seconds goal for image xmit; up to 64Kbit comm link

Modem functions - built in FEC

Remote Control (configure) capability:

- New call signs
- Set compression ratio
- Snap picture
- Retrieve image

SECTION 5

DRAWING
AND
BLOCK DIAGRAM

Figure 1 - Micro ™ Drawing

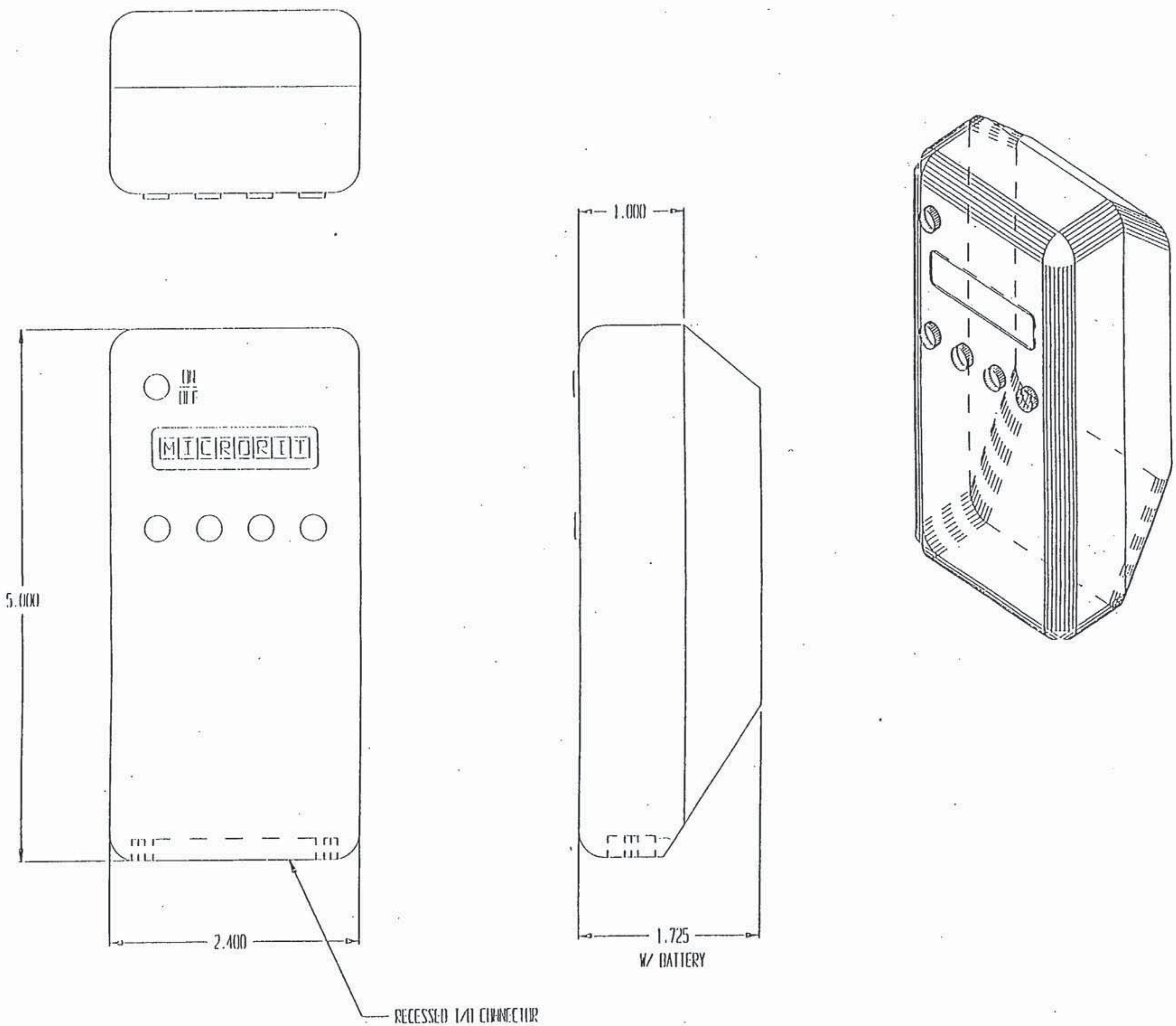
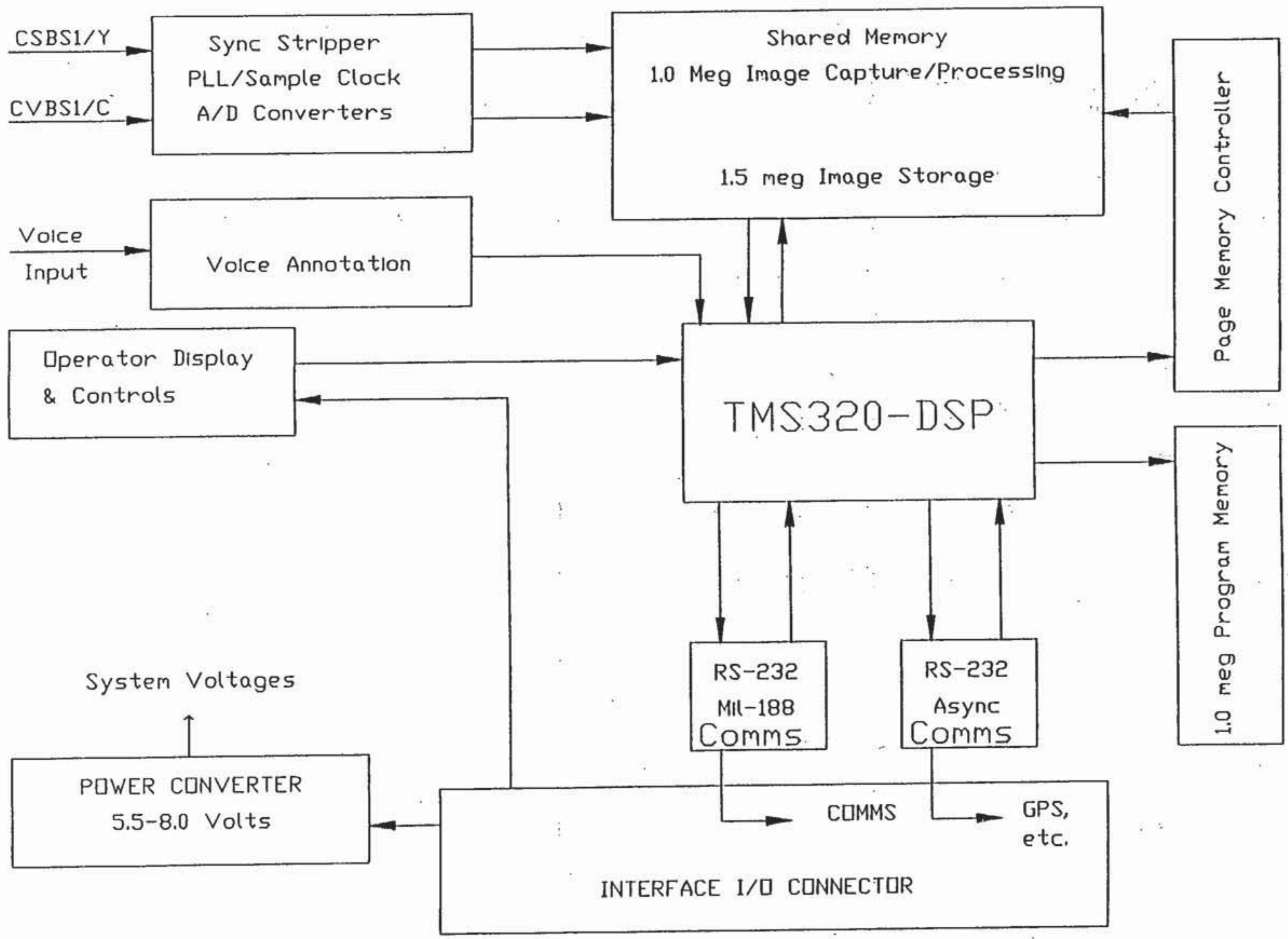


Figure 2 - MicroRIT™ Block Diagram



MICRO-RIT ™ BLOCK DIAGRAM

SECTION 6

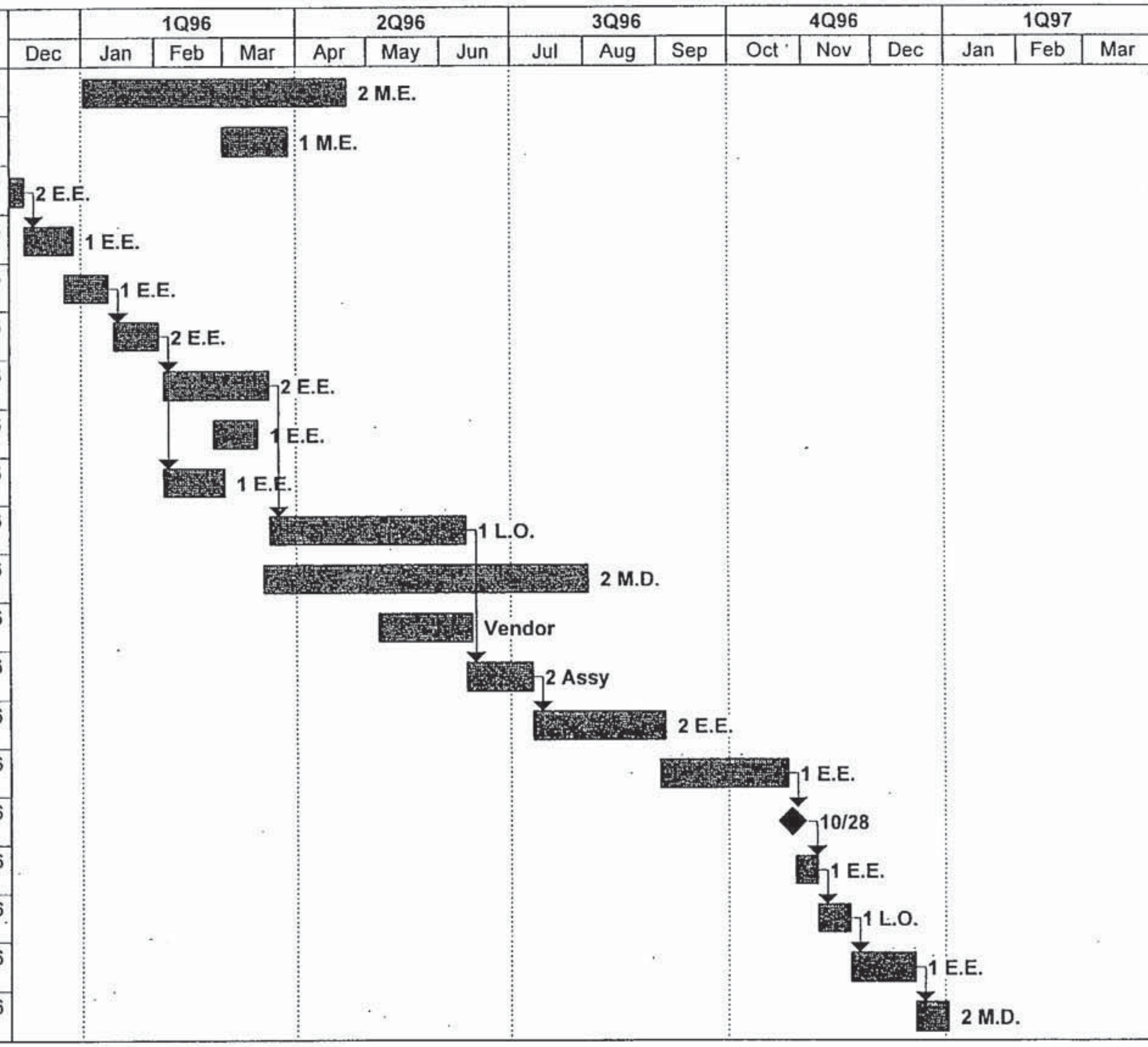
SCHEDULE

ID	Tas	29
1	Pro	
2	Wri	
3	Eva	
4	Eva	
5	Eva	
6	DSF	
7	O/S	
8	Orde	
9	Write	
10	**Syst**	
11		
12		
13		
14		
15		
16		
17		
18	**Vide**	
19	V	
20	V	
21	V	
22	F	
23	F	
24	I	
25	**Comr**	
26	A	
27	S	
28	P	
29	P	
30	**Audio**	
31	A	
32	A	
33	A	
34	A	
35	**User I**	
36	LE	
37	P	
38	M	
39	**Remot**	
40	Re	
41	Do	
42	Hardwa	
43	System	
44	User M	
45	System	
46	Write A	
47	Custom	
48	**Montly**	
61	**Custom**	
68	Delivery	

Project: microrit
Date: Thu 11/2/9

MicroRit Hardware Development

ID	Task Name	Duration	Start
1	Package Design	16w	Tue 1/2/96
2	Control Panel & I/O Interface	4w	Fri 3/1/96
3	DSP Evaluation/Selection	1w	Fri 12/1/95
4	Block Diagram	3w	Fri 12/8/95
5	Engineering Specs	3w	Mon 12/25/95
6	Component Selection	3w	Mon 1/15/96
7	Schematic Design/Capture	6.5w	Mon 2/5/96
8	Power Heat Analysis	3w	Mon 2/26/96
9	Interconnect & Cabling Design	4w	Mon 2/5/96
10	PWB Artwork Layouts (3 ea)	12w	Wed 3/20/96
11	Documentation	20w	Mon 3/18/96
12	Prototype Build (FAB)	6w	Mon 5/6/96
13	Prototype Build (Assy)	4w	Wed 6/12/96
14	Prototype Checkout	8w	Wed 7/10/96
15	System Integration H/W-S/W	8w	Mon 9/2/96
16	Prototype Delivery (2 ea)	1d	Mon 10/28/96
17	Schematic Updates (Pass 2)	1.5w	Tue 10/29/96
18	Artwork Updates (Pass 2)	2w	Thu 11/7/96
19	Assy/Checkout (Pass 2)	4w	Thu 11/21/96
20	Pass 2 Updates/Release	2w	Thu 12/19/96



SECTION 7

COST DETAIL

MICRO-RIT
PHOTOTELESIS

Micro-Rit

Hardware	Hours	Rates	Labor $	Materials	Overhead	Total Cost
Mechanical design						
Packaging	1040	$26.62	$27,684.80		$69,212.00	$96,896.80
Control Panel & I/O Interface	160	$27.47	$4,395.20		$10,988.00	$15,383.20
Electrical design						
DSP Evaluation /Selection	80	$30.52	$2,441.60		$6,104.00	$8,545.60
Block Diagram	120	$30.52	$3,662.40		$9,156.00	$12,818.40
Engineering Specifications/ Updates	240	$30.52	$7,324.80		$18,312.00	$25,636.80
Component Selection	180	$30.52	$5,493.60		$13,734.00	$19,227.60
Power/Heat Analysis	120	$42.19	$5,062.80		$12,657.00	$17,719.80
Interconnect/Cabling Design	160	$26.62	$4,259.20		$10,648.00	$14,907.20
Schematic Design/Capture	520	$30.56	$15,891.20		$39,728.00	$55,619.20
Schematic update Pass2 (3 each)	80	$30.56	$2,444.80		$6,112.00	$8,556.80
PWB artwork desgin/layout (3 each)	480	$22.92	$11,001.60		$27,504.00	$38,505.60
PWB layout Pass 2 (2 each)	120	$22.92	$2,750.40		$6,876.00	$9,626.40
Documentation	800	$19.53	$15,624.00		$39,060.00	$54,684.00
Prototype						
Assembly /Checkout labor	960	$21.93	$21,052.80		$52,632.00	$73,684.80
Materials & Fab				$30,000.00		$30,000.00
H/W Project Management	480	$42.19	$20,251.20		$50,628.00	$70,879.20
Project review	320	$42.19	$13,500.80		$33,752.00	$47,252.80
Development Equipment						
DSP Development station	320	$27.47	$8,790.40	$15,000.00	$21,976.00	$45,766.40
DSP Evaluation Kit	160	$27.47	$4,395.20		$10,988.00	$15,383.20
Total Hardware	6340		$176,026.80	$45,000.00	$440,067.00	$661,093.80

MICRO-RIT
PHOTOTELESIS

Software	Hours	Rates	Labor $	Materials	Overhead	Total Cost
Specification Document	80	$32.81	$2,624.80		$6,562.00	$9,186.80
Evaluate and select DSP	80	$32.81	$2,624.80		$6,562.00	$9,186.80
Evaluate and Select Operating system	170	$31.51	$5,356.70		$13,391.75	$18,748.45
Evaluate and Select Complier	170	$31.51	$5,356.70		$13,391.75	$18,748.45
Other Development O/S complier				$15,000.00	$0.00	$15,000.00
Software Specification	170	$32.81	$5,577.70		$13,944.25	$19,521.95
System Management Functions						
Memory Management Routines						
Code Space Manager	320	$30.21	$9,667.20		$24,168.00	$33,835.20
Data Space Manager	320	$32.81	$10,499.20		$26,248.00	$36,747.20
Reflash Interface	160	$25.00	$4,000.00		$10,000.00	$14,000.00
Interrupt Handling	160	$32.81	$5,249.60		$13,124.00	$18,373.60
Power Management	320	$25.00	$8,000.00		$20,000.00	$28,000.00
Video System						
Video Frame Grabber S/W	420	$28.91	$12,140.10		$30,350.25	$42,490.35
Video Demodulation S/W S-Video	160	$32.81	$5,249.60		$13,124.00	$18,373.60
Video Demodulation S/W Composite	160	$32.81	$5,249.60		$13,124.00	$18,373.60
Port Wavelet compressor	240	$32.81	$7,874.40		$19,686.00	$27,560.40
Port JPEG compressor	240	$25.00	$6,000.00		$15,000.00	$21,000.00
Image Storage Handler	80	$30.21	$2,416.80		$6,042.00	$8,458.80
Communications System						
Asynch Port Interface	60	$25.00	$1,500.00		$3,750.00	$5,250.00
Synch Port Interface	120	$25.00	$3,000.00		$7,500.00	$10,500.00
Port PTAC	1650	$28.91	$47,693.25		$119,233.13	$166,926.38
Port PTAC-2	240	$25.00	$6,000.00		$15,000.00	$21,000.00
Audio System	545	$32.64	$17,791.00		$44,477.50	$62,268.50
User Interface	160	$30.21	$4,833.60		$12,084.00	$16,917.60
LED Display Driver	60	$25.00	$1,500.00		$3,750.00	$5,250.00
Push Button Interface	60	$25.00	$1,500.00		$3,750.00	$5,250.00
Menuing Interface	120	$25.00	$3,000.00		$7,500.00	$10,500.00
Remote Control/Host Mode						
Remote Control Interface	480	$30.21	$14,500.80		$36,252.00	$50,752.80
Docking Station Interface	320	$30.21	$9,667.20		$24,168.00	$33,835.20

CONFIDENTIAL DATA

MICRO-RIT
PHOTOTELESIS

Software	Hours	Rates	Labor $	Materials	Overhead	Total Cost
System Integration	1200	$28.26	$33,906.00		$84,765.00	$118,671.00
User Manuals	280	$21.10	$5,906.60		$14,766.50	$20,673.10
System Checkout & rework	475	$25.72	$12,217.30		$30,543.24	$42,760.54
Write acceptance test plan	120	$38.91	$4,668.60		$11,671.50	$16,340.10
Customer Acceptance test Plan	14	$45.84	$641.76		$1,604.40	$2,246.16
Management	277.2	$38.91	$10,784.47		$26,961.17	$37,745.63
Total Software	9431.2		$276,997.77	$15,000.00	$692,494.43	$984,492.21
Combined	15771.2		$453,024.57	$60,000.00	$1,132,561.43	$1,645,586.01

CONFIDENTIAL DATA

SECTION 8

PERSONNEL RESUMES

BRUCE C. MATHER

Manager of Software Engineering
PhotoTelesis...a business of Texas Instruments Incorporated

Dr. Mather joined PhotoTelesis Corporation in December 1993, as Director of Software Engineering. Prior to joining PhotoTelesis, he was a Senior Research Engineer at Southwest Research Institute where he was employed for seven years. He also serves as an Adjunct Professor at St. Mary's University where he teaches a course in Digital Speech Processing.

Among Dr. Mather's technical areas of expertise are robotic systems, image processing, machine perception, neural networks, virtual reality, multimedia database systems and digital signal processing. He is a member of the Institute of Electrical and Electronic Engineers (IEEE), the Society of Manufacturing Engineers (SME), and the International Neural Network Society (INNS).

Dr. Mather attended the University of Illinois in Champaign, Urbana, where he earned his BSEE degree in 1980, his MSEE in 1983, and his PhD in Electrical Engineering in 1986. He graduated with highest honors and received the Eta Kappa Nu Senior Honor Award for academic excellence. His PhD dissertation involved advanced, multidimentional digital signal processing (DSP) of synthetic aperture radar (SAR) data.

At Southwest Research Institute, while working in their Advanced Robotics Department, he designed and developed interprocess and intercomputer communication and synchronization in the C programming language under the Unix operating system.

In 1991, Bruce joined the Advanced Training Concepts Section at SWRI and was instrumental in the development of the Visual Information System multimedia database product which runs under Windows 3.1. He also worked on an IR&D project involving a Virtual Environment system for multidimensional data visualization. His other areas of interest include speech recognition, position sensing, and holographic sound.

ROGER D. VEST

Manager of Hardware Engineering
PhotoTelesis...a business of Texas Instruments Incorporated

Mr. Vest joined PhotoTelesis Corporation in January of 1994 as Director of Hardware Engineering. Previously, he was Manager of Engineering for CompuAdd Express Corporation in Austin, Texas. In that position, he reported to the President and was responsible for all phases of product development and product sourcing. During his time there, three portable computer (notebook) products were introduced.

Prior to CompuAdd Express, Mr. Vest was employed by Texas Instruments, also in Austin, for over fifteen years. When he resigned to accept the CompuAdd Express position, he was a Senior Member of the Technical Staff. During his last year with TI, Mr. Vest managed a PWB design/layout center for their Custom Manufacturing Group. This effort included initial layout, prototype PWB fabrication, PWB assembly, and prototype checkout of customer products for several high volume computer suppliers. He has an extensive background in surface-mount technology, including footprint design, PWB layout guidelines and automatic test compatibility. He has published several articles on surface-mount technology design rules and footprint requirements.

Mr. Vest graduated from Texas Tech University in Lubbock, Texas, with a Bachelor of Science degree in Electrical Engineering. He was on the Dean's list at the time of his graduation.

WILLIAM A. KIDD

Program Manager

PhotoTelesis...a business of Texas Instruments Incorporated

Mr. Kidd joined Texas Instruments in June 1988. While assigned to the Airborne department of the Defense Systems and Electronics Group, Mr. Kidd was a member of the Light Helicopter program where he was the Program Control manager and cost account manager for several hundred data item submittals. Follow-on assignments included management support to numerous projects. Most recently Mr. Kidd was transferred to PhotoTelesis, a business of Texas Instruments, where he was assigned the program management responsibility for the U.S. Army's Light Weight Video Reconnaissance System (LVRS).

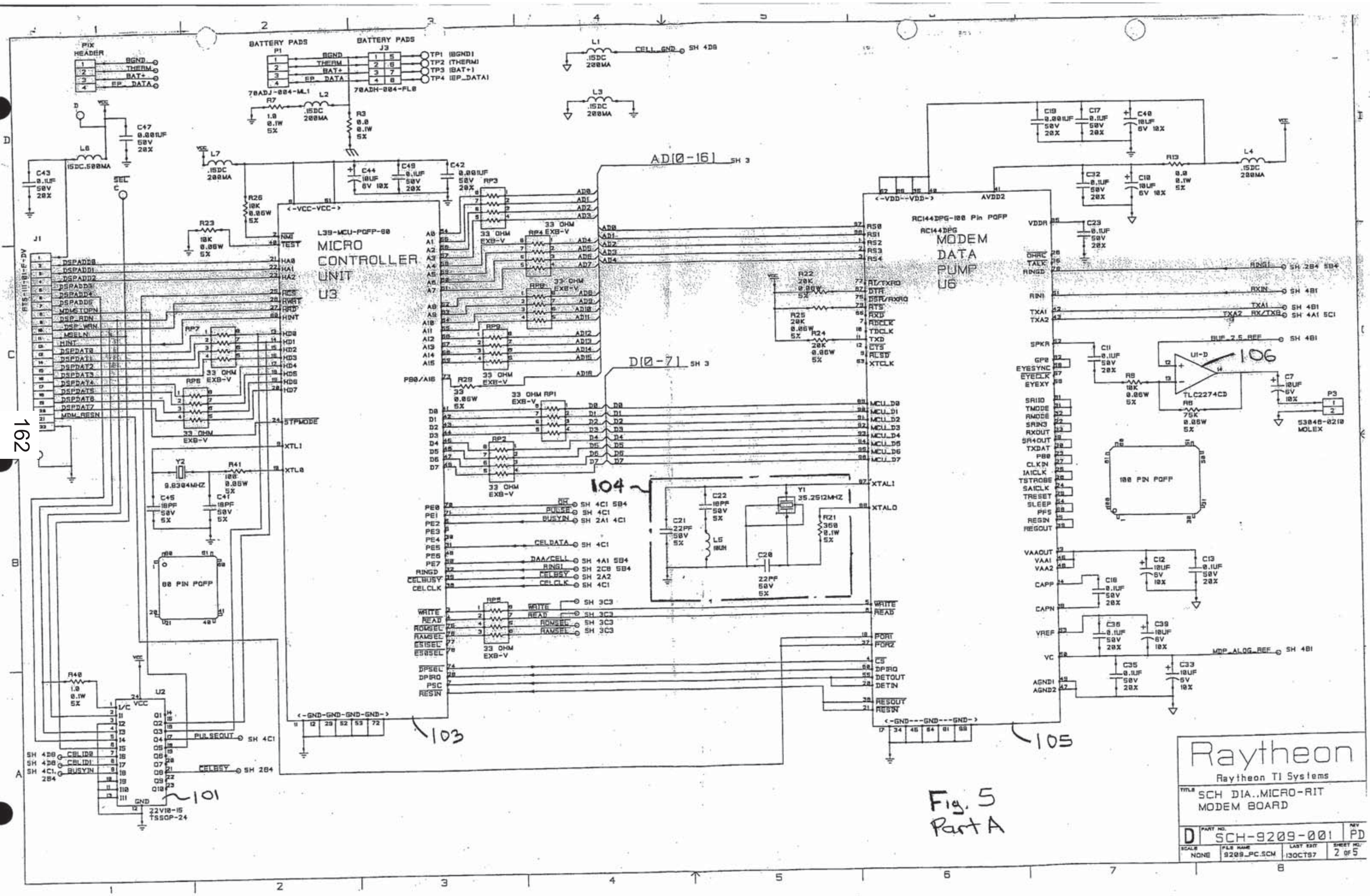
Mr. Kidd developed an excellent understanding of DoD acquisition while on active duty with the U.S. Air Force from 1967-1988. During his military career he gained more than 20 years direct experience in DoD Systems Acquisition Management. At the time of his retirement, Mr. Kidd was the Commander of Air Force Systems Command's, Systems Acquisition School. Previous Air Force program management assignments included the Pave Tack Pod program, the Pave Tack Forward Looking Infrared (FLIR) subsystem, and the Pave Tiger Mini-Drone program. Other relevant Air Force assignments include schedule planning and control for launch, on-orbit support, and recovery of satellite payloads, and Air Force Plant Representative Officer at a defense contractor's facility, responsible for on-site engineering management of DEM/VAL and production programs.

Mr. Kidd has an MS degree in Engineering Management from Arizona State University, Tempe, AZ. His undergraduate BS degree in Mechanical Engineering, was received from Grove City College, Grove City, PA.

EXHIBIT 15


Raytheon
MicroRIT™
PhotoTelesis
Image Transmission™
Patent Pending
7800 IH-10 West, Suite 700
San Antonio, Tx 78230-4753
Tel:210.349.2020
Fax: 210.341.1020
www.raytheon.com/photot
MicroRIT
97112020

EXHIBIT 16



MICRO CONTROLLER UNIT U3
L39-MCU-PQFP-80
MODEM DATA PUMP U6
RC144DPG-100 Pin PQFP
RC144DPG
AD[0-16]
D[0-7]
100 PIN PQFP
80 PIN PQFP
BATTERY PADS
PIX HEADER
TLC2274CD
22V10-15 TSSOP-24
53048-0210 MOLEX
101
103
104
105
106
Raytheon
Raytheon TI Systems
SCH DIA..MICRO-RIT MODEM BOARD
SCH-9209-001
9209_PC.SCM
13OCT97
2 OF 5

Fig. 5 Part A

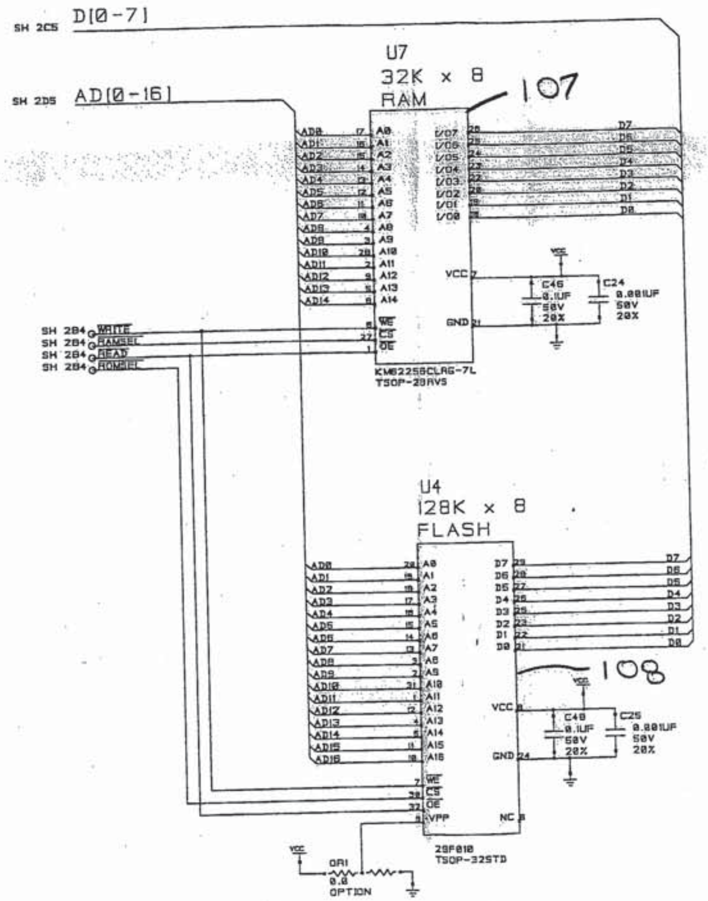


FIG. 5
Part B

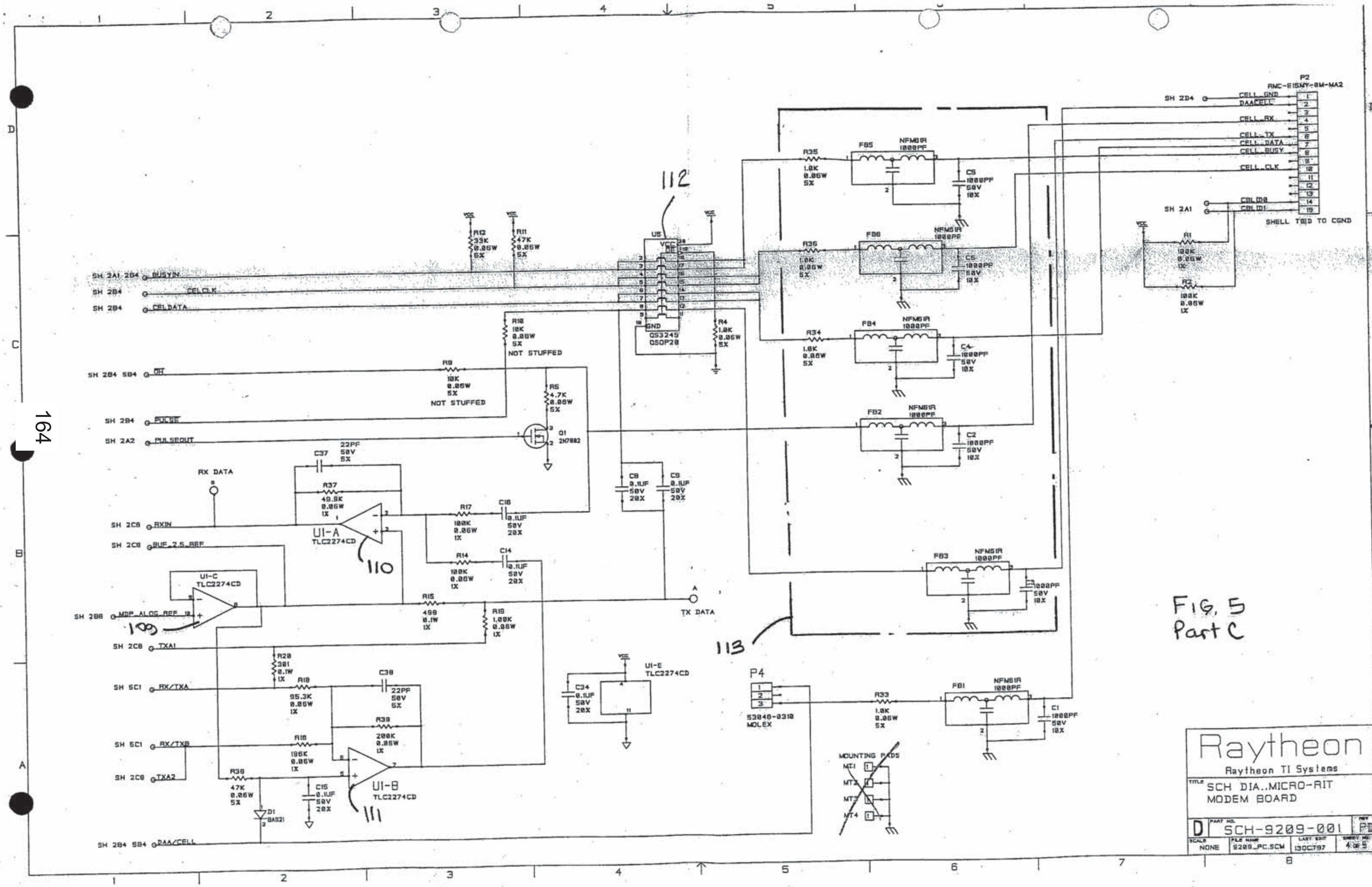
Raytheon

Raytheon TI Systems

TITLE SCH DIA..MICRO-RIT MODEM BOARD

D PART NO. SCH-9209-001 REV PB

SCALE NONE FILE NAME 9209_PC.SCM LAST EDIT 13OCT97 SHEET NO. 3


Raytheon
Raytheon TI Systems
SCH DIA..MICRO-RIT MODEM BOARD
SCH-9209-001
9209_PC.SCM
13OCT97
Fig. 5 Part C
112
113
110
111
109
P2
RMC-E15MY-8M-MA2
CELL_GND
DAACELL
CELL_RX
CELL_TX
CELL_DATA
CELL_BUSY
CELL_CLK
CBLID0
CBLID1
SHELL TIED TO CGND
U5
QS3245
QSOP20
NFM61R
1000PF
TX DATA
RX DATA
U1-A
U1-B
U1-C
U1-E
TLC2274CD
P4
53048-0310
MOLEX
MOUNTING PADS
NOT STUFFED
Q1
2N7002
D1
BAS21
BUSYIN
CELCLK
CELDATA
PULSE
PULSEOUT
RXIN
BUF_2.5_REF
MDP_ALOG_REF
TXA1
RX/TXA
RX/TXB
TXA2
DAA/CELL

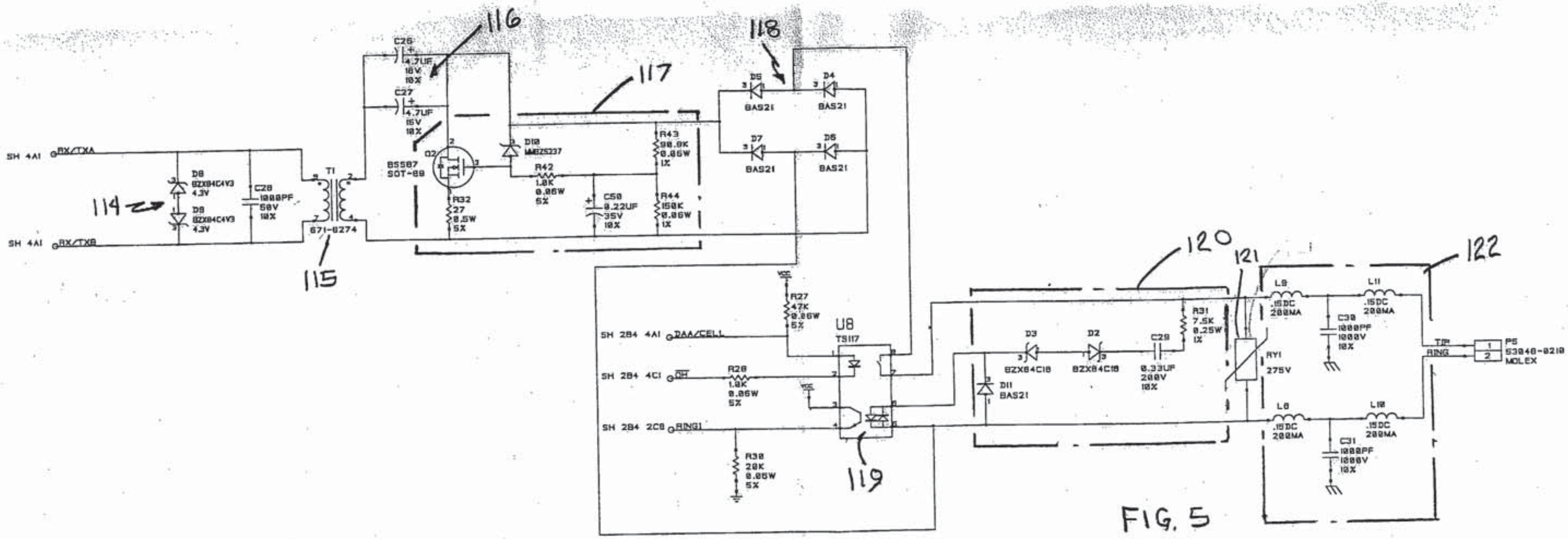
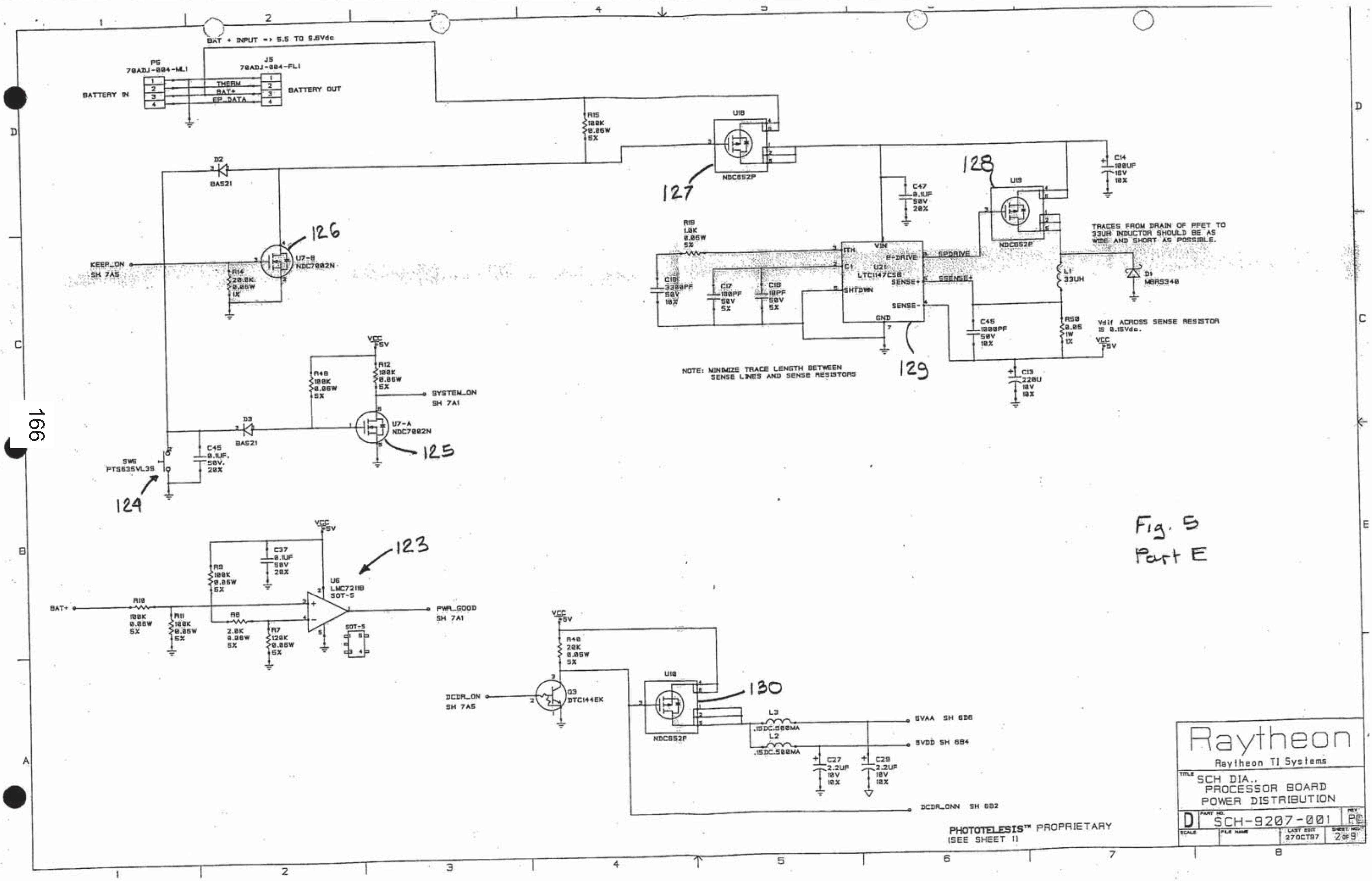


FIG. 5
Part D

Raytheon
Raytheon TI Systems

TITLE SCH DIA..MICRO-RIT MODEM BOARD			
D	PART NO. SCH-9209-001		REV PD
SCALE NONE	FILE NAME 9209_PC.SCM	LAST EDIT 13OCT97	SHEET NO. 5 OF 5


BAT + INPUT -> 5.5 TO 9.8Vdc
P5
70ADJ-004-ML1
BATTERY IN
J5
70ADJ-004-FL1
THERM
BAT+
EP_DATA
BATTERY OUT
R15 100K 0.06W 5%
U18
NDC652P
127
D2
BAS21
126
U7-B
NDC7002N
KEEP_ON
SH 7A5
R14 20.0K 0.06W 1%
R19 1.0K 0.06W 5%
C16 3300PF 50V 10%
C17 100PF 50V 5%
C18 10PF 50V 5%
C47 0.1UF 50V 20%
U21
LTC1147CS8
VIN
ITH
C1
SHTDWN
P-DRIVE
SENSE+
SENSE-
GND
SPDRIVE
SSENSE+
128
U19
NDC652P
C14 100UF 16V 10%
TRACES FROM DRAIN OF PFET TO 33UH INDUCTOR SHOULD BE AS WIDE AND SHORT AS POSSIBLE.
L1 33UH
D1 MBRS340
R50 0.05 1W 1%
Vdif ACROSS SENSE RESISTOR IS 0.15Vdc.
VCC +5V
C46 1000PF 50V 10%
C13 220U 10V 10%
129
NOTE: MINIMIZE TRACE LENGTH BETWEEN SENSE LINES AND SENSE RESISTORS
R48 100K 0.06W 5%
R12 100K 0.06W 5%
SYSTEM_ON
SH 7A1
D3
BAS21
U7-A
NDC7002N
125
SW5
PTS635VL3S
C45 0.1UF. 50V. 20%
124
C37 0.1UF 50V 20%
R9 100K 0.06W 5%
123
U6
LMC7211B
SOT-5
BAT+
R10 100K 0.06W 5%
R11 100K 0.06W 5%
R8 2.0K 0.06W 5%
R7 120K 0.06W 5%
PWR_GOOD
SH 7A1
R40 20K 0.06W 5%
DCDR_ON
SH 7A5
Q3
DTC144EK
U18
NDC652P
130
L3
.15DC.500MA
L2
.15DC.500MA
C27 2.2UF 10V 10%
C29 2.2UF 10V 10%
5VAA SH 6D6
5VDD SH 6B4
DCDR_ONN SH 6B2
PHOTOTELESIS™ PROPRIETARY
(SEE SHEET 1)
Fig. 5
Part E
Raytheon
Raytheon TI Systems
SCH DIA.,
PROCESSOR BOARD
POWER DISTRIBUTION
D
SCH-9207-001
27OCT97
2 OF 9

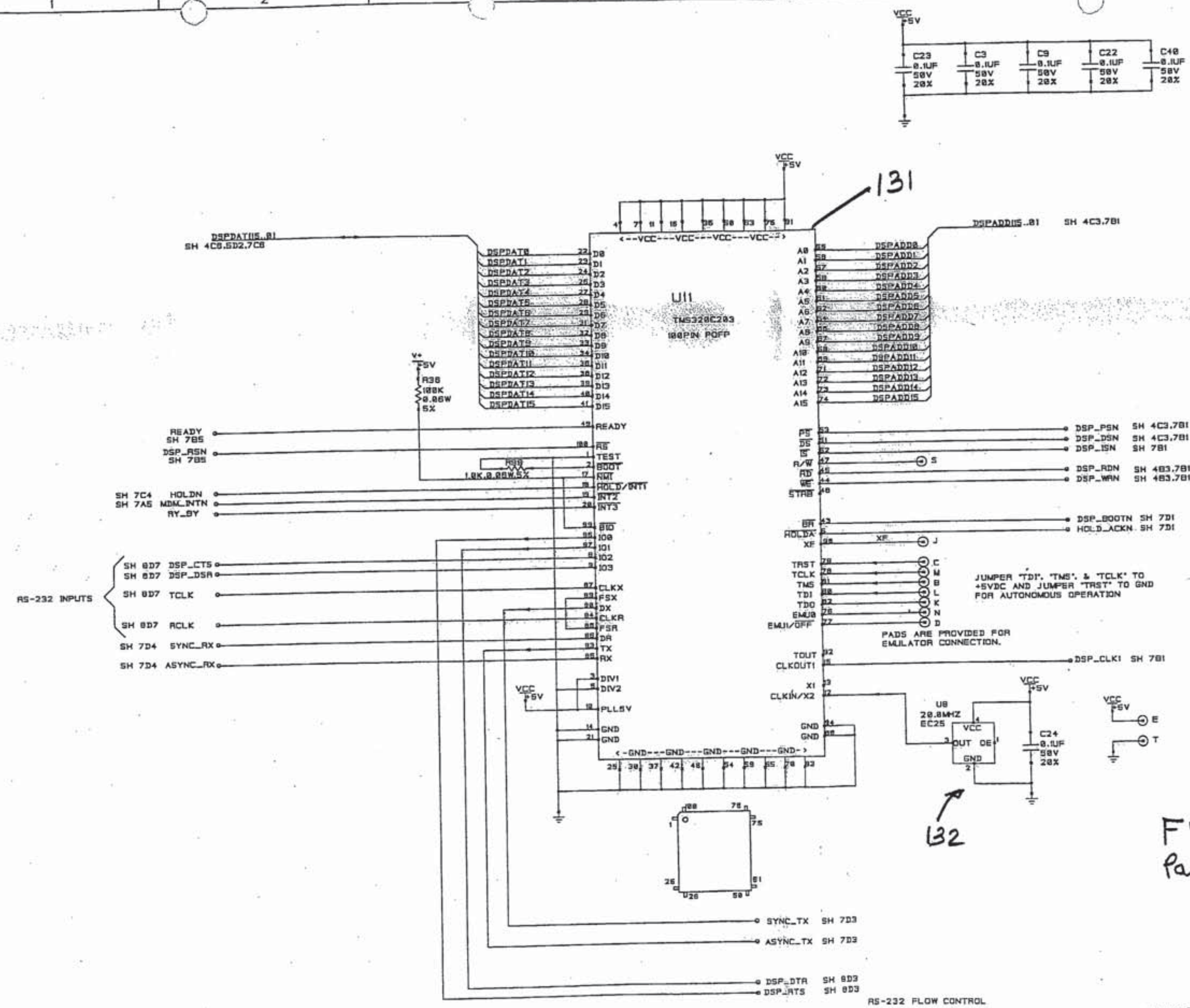


FIG. 5
Part F

PHOTOTELESIS™ PROPRIETARY
(SEE SHEET 1)

Raytheon
Raytheon TI Systems

TITLE SCH DIA.,
PROCESSOR BOARD
DIGITAL SIGNAL PROCESSOR

SIZE	PART NO.	REV
D	SCH-9207-001	PC
SCALE	FILE NAME / LAST EDIT 27OCT97	SHEET NO. 3 OF 9

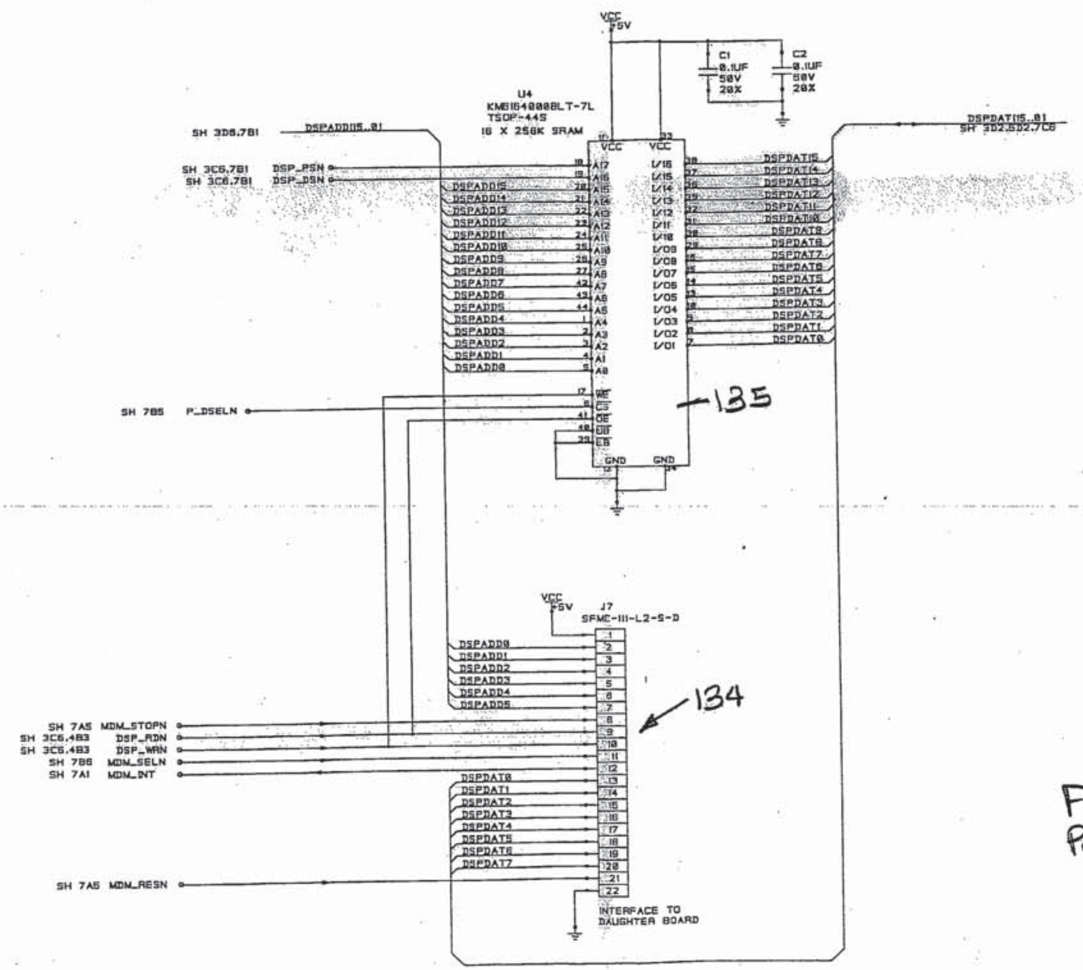


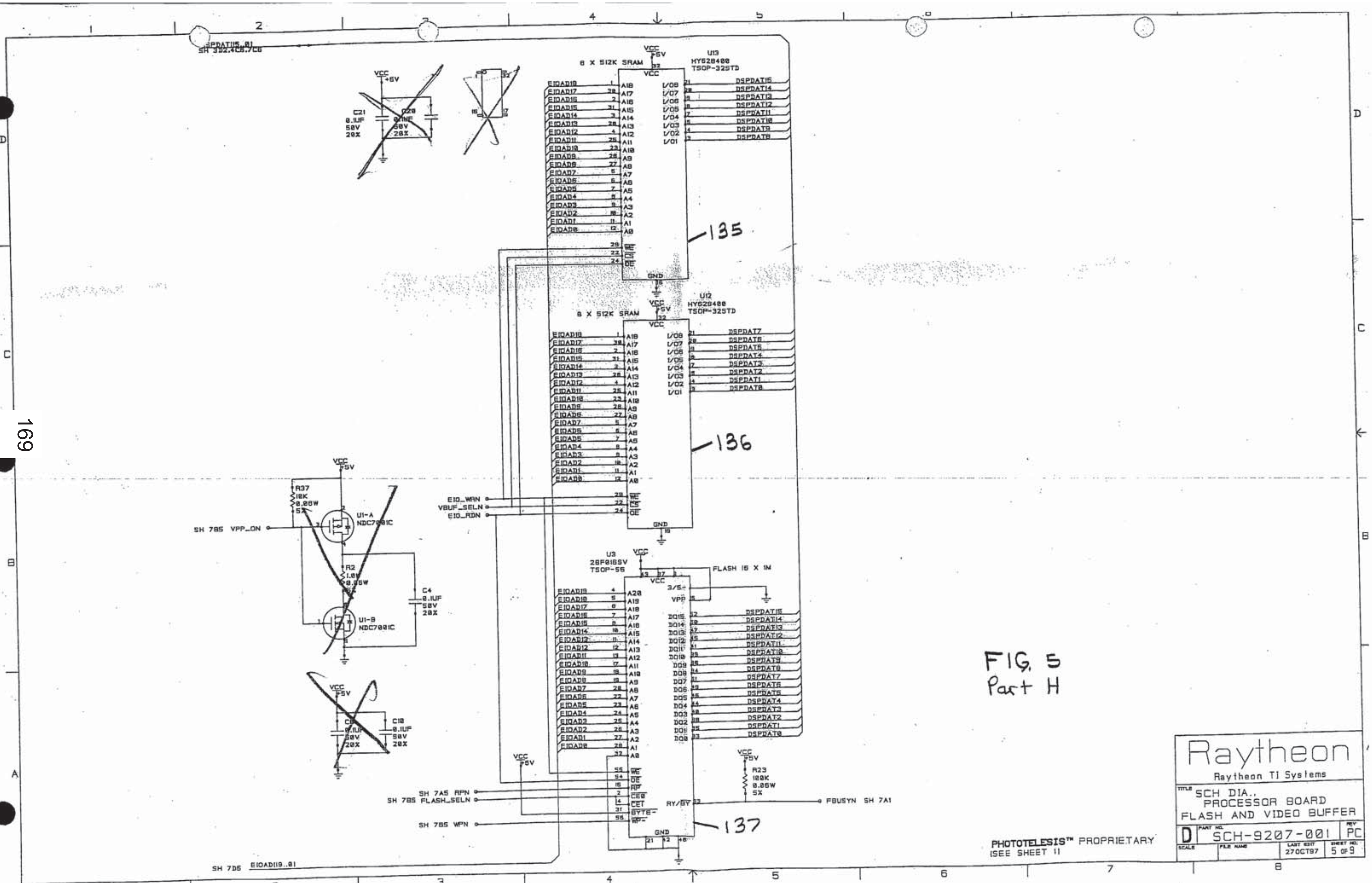
FIG. 5
Part G

PHOTOTELESIS™ PROPRIETARY
(SEE SHEET 11

Raytheon
Raytheon TI Systems

TITLE SCH DIA.. PROCESSOR BOARD PROGRAM AND DATA RAM

SIZE	PART NO.		REV
D	SCH-9207-001		PC
SCALE	FILE NAME	LAST EDIT 27OCT97	SHEET NO. 4 OF 9


8 X 512K SRAM
U13
HY628400
TSOP-32STD
135
U12
HY628400
TSOP-32STD
136
U3
28F016SV
TSOP-56
FLASH 16 X 1M
137
EIO_WRN
VBUF_SELN
EIO_RDN
SH 7B5 VPP_ON
U1-A
NDC7001C
U1-B
NDC7001C
SH 7A5 RPN
SH 7B5 FLASH_SELN
SH 7B5 WPN
FBUSYN SH 7A1
SH 7D5 EIOAD(19..0)
PHOTOTELESIS™ PROPRIETARY
(SEE SHEET 11
Raytheon
Raytheon TI Systems
SCH DIA.,
PROCESSOR BOARD
FLASH AND VIDEO BUFFER
D
SCH-9207-001
PC
27OCT97
5 OF 9
FIG. 5
Part H

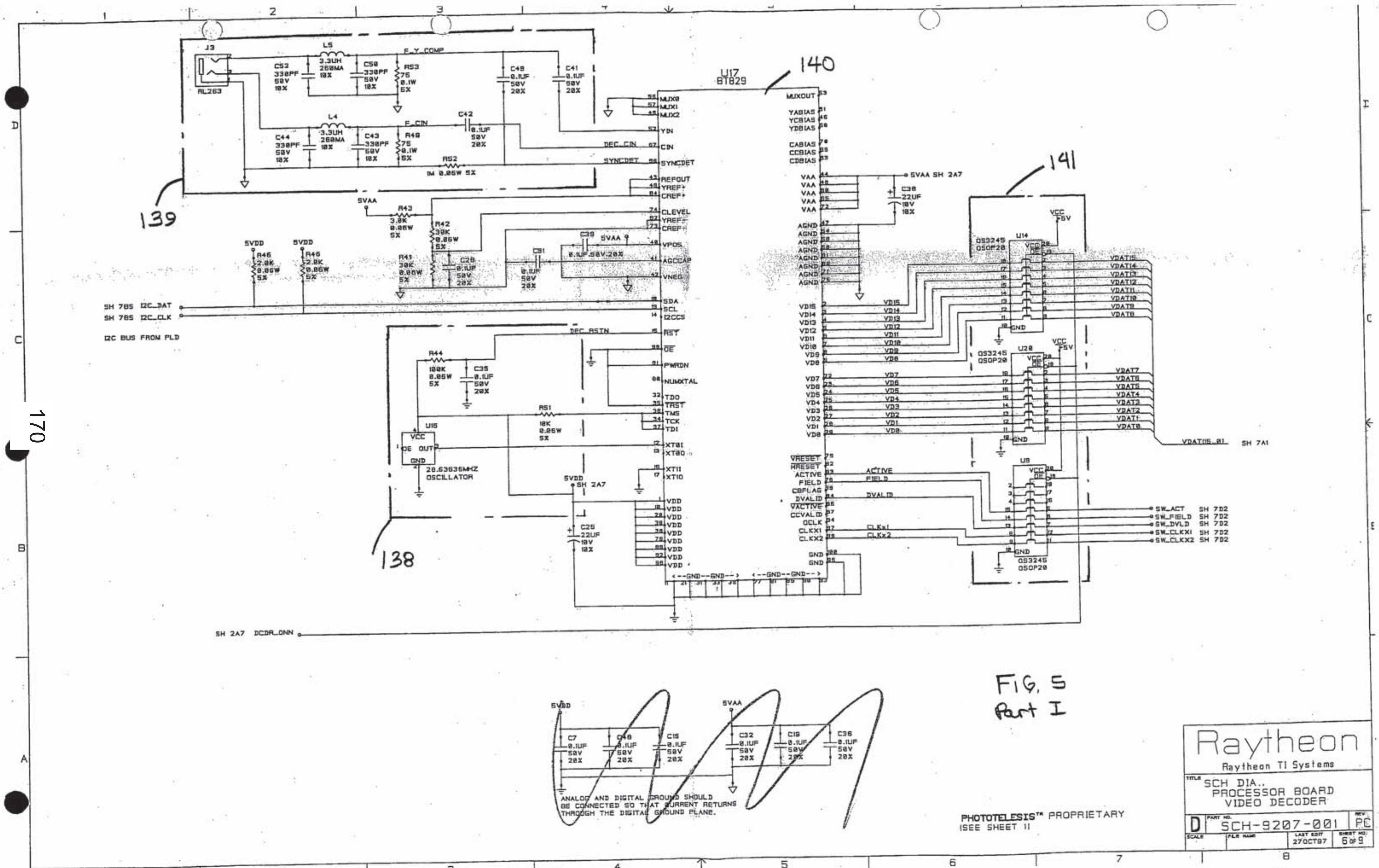

U17
BT829
PHOTOTELESIS™ PROPRIETARY
(SEE SHEET 11
ANALOG AND DIGITAL GROUND SHOULD BE CONNECTED SO THAT CURRENT RETURNS THROUGH THE DIGITAL GROUND PLANE.
Raytheon
Raytheon TI Systems
SCH DIA..
PROCESSOR BOARD
VIDEO DECODER
D
SCH-9207-001
PC
27OCT97
6 of 9

FIG. 5
Part I

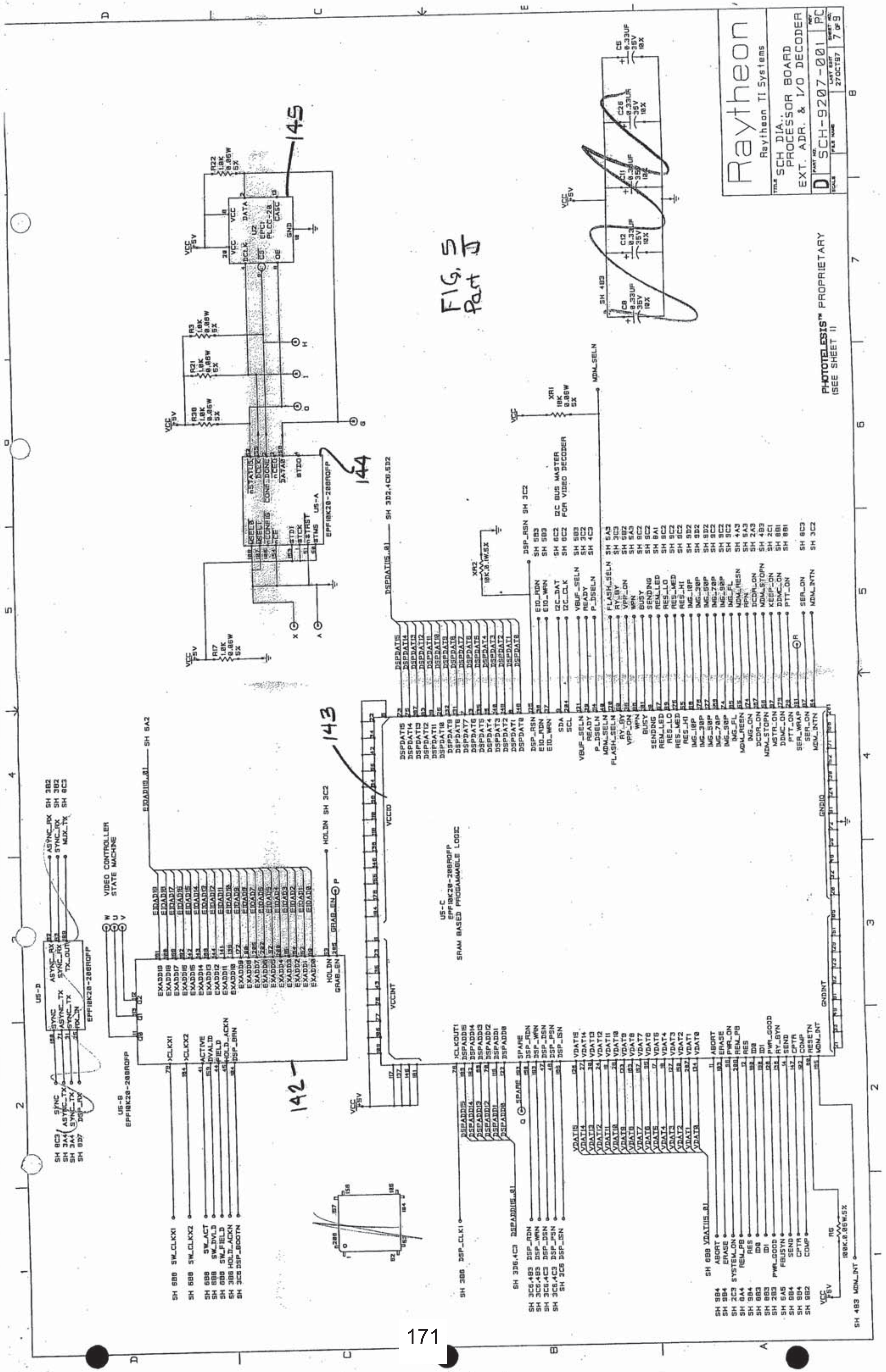


FIG. 5 Part J
142
143
144
145
U5-A EPF10K20-208RQFP
U5-B EPF10K20-208RQFP
U5-C EPF10K20-208RQFP SRAM BASED PROGAMMABLE LOGIC
U5-D EPF10K20-208RQFP
VIDEO CONTROLLER STATE MACHINE
I2C BUS MASTER FOR VIDEO DECODER
PHOTOTELESIS™ PROPRIETARY (SEE SHEET 1)
Raytheon
Raytheon TI Systems
SCH DIA. PROCESSOR BOARD EXT. ADR. & I/O DECODER
SCH-9207-001
27OCT97
7 OF 9

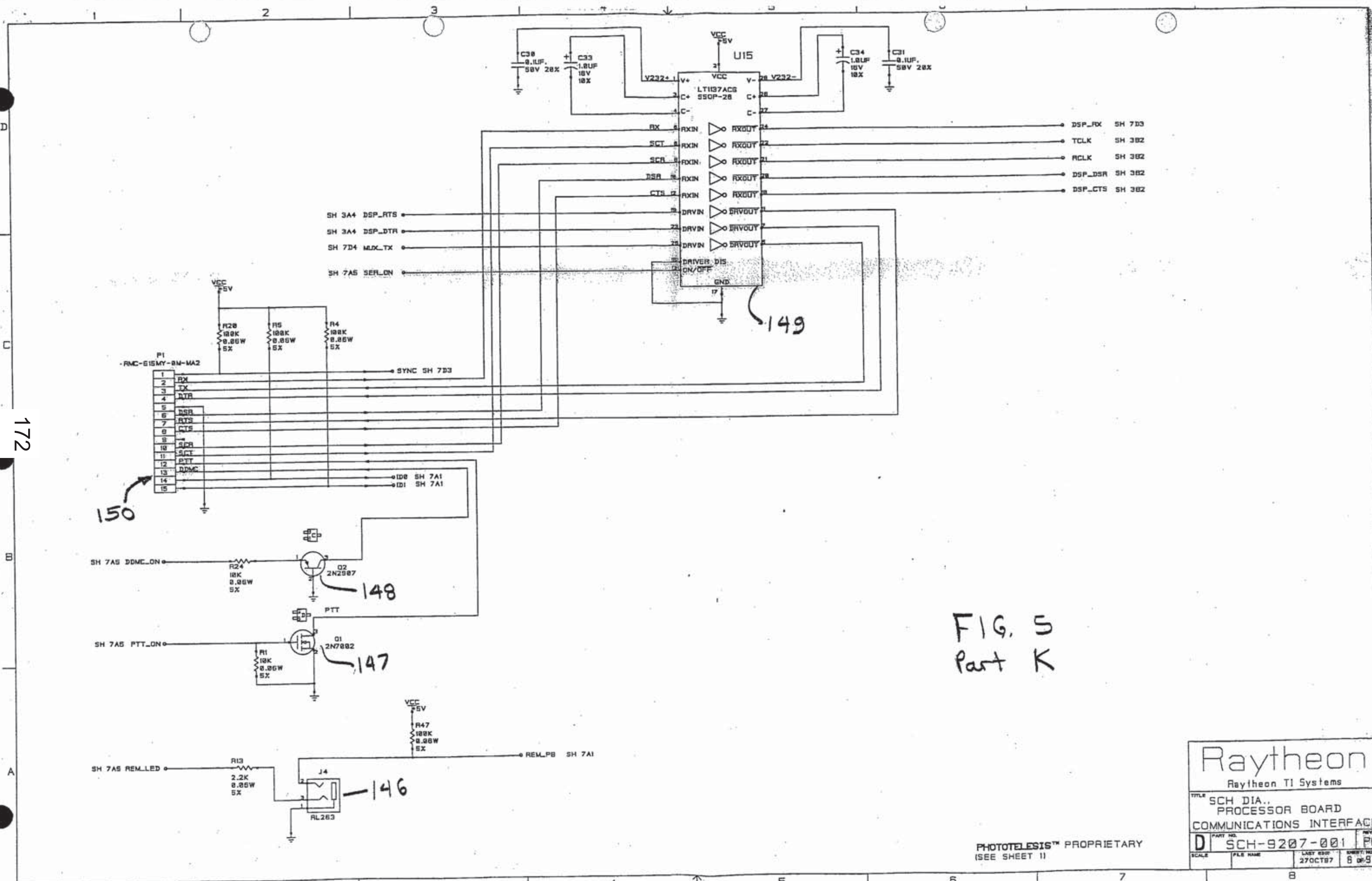

U15
LT1137ACG SSOP-28
VCC +5V
C38 0.1UF. 50V 20%
C33 1.0UF 16V 10%
C34 1.0UF 16V 10%
C31 0.1UF. 50V 20%
V232+
V232-
RX
SCT
SCR
DSR
CTS
RXIN
RXOUT
DRVIN
DRVOUT
DRIVER DIS ON/OFF
GND
DSP_RX SH 7D3
TCLK SH 3B2
RCLK SH 3B2
DSP_DSR SH 3B2
DSP_CTS SH 3B2
SH 3A4 DSP_RTS
SH 3A4 DSP_DTR
SH 7D4 MUX_TX
SH 7A5 SER_ON
R20 100K 0.06W 5%
R5 100K 0.06W 5%
R4 100K 0.06W 5%
P1
-RMC-615MY-0M-MA2
RX
TX
DTR
DSR
RTS
CTS
SCR
SCT
PTT
DDMC
SYNC SH 7D3
ID0 SH 7A1
ID1 SH 7A1
150
SH 7A5 DDMC_ON
R24 10K 0.06W 5%
Q2 2N2907
148
PTT
SH 7A5 PTT_ON
R1 10K 0.06W 5%
Q1 2N7002
147
R47 100K 0.06W 5%
REM_PB SH 7A1
SH 7A5 REM_LED
R13 2.2K 0.06W 5%
J4
RL263
146
149
PHOTOTELESIS™ PROPRIETARY
(SEE SHEET 1)
Raytheon
Raytheon TI Systems
TITLE SCH DIA.. PROCESSOR BOARD COMMUNICATIONS INTERFACE
D
SCH-9207-001
PC
270CT97
8 OF 9

FIG. 5
Part K

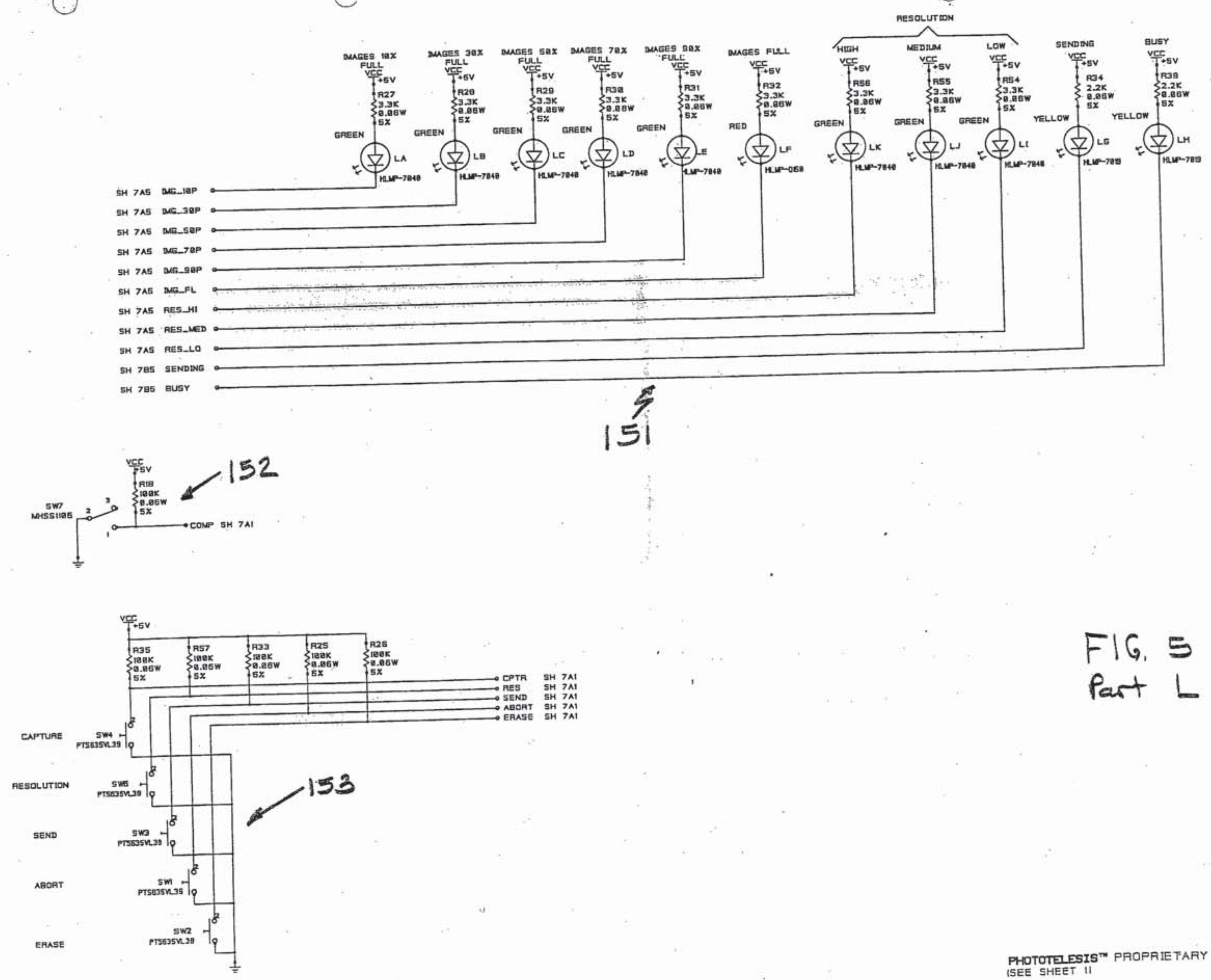
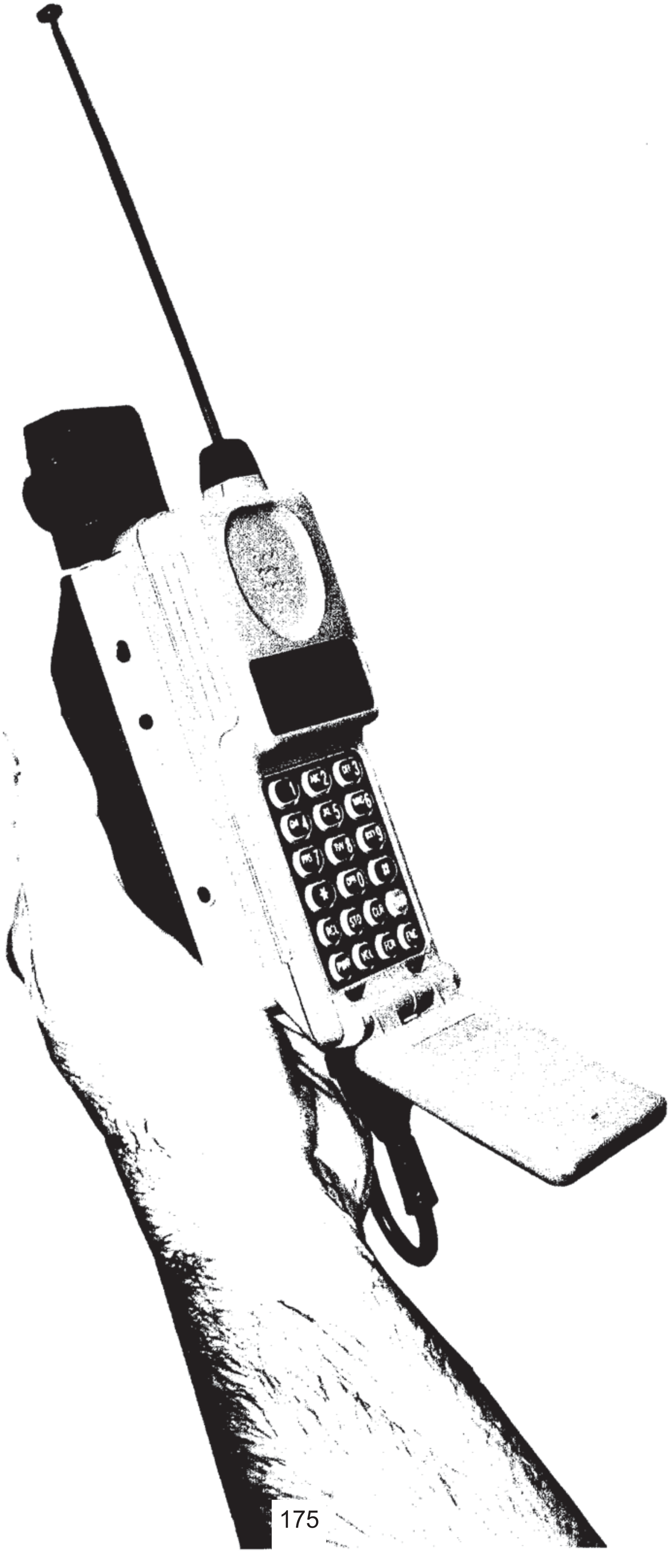


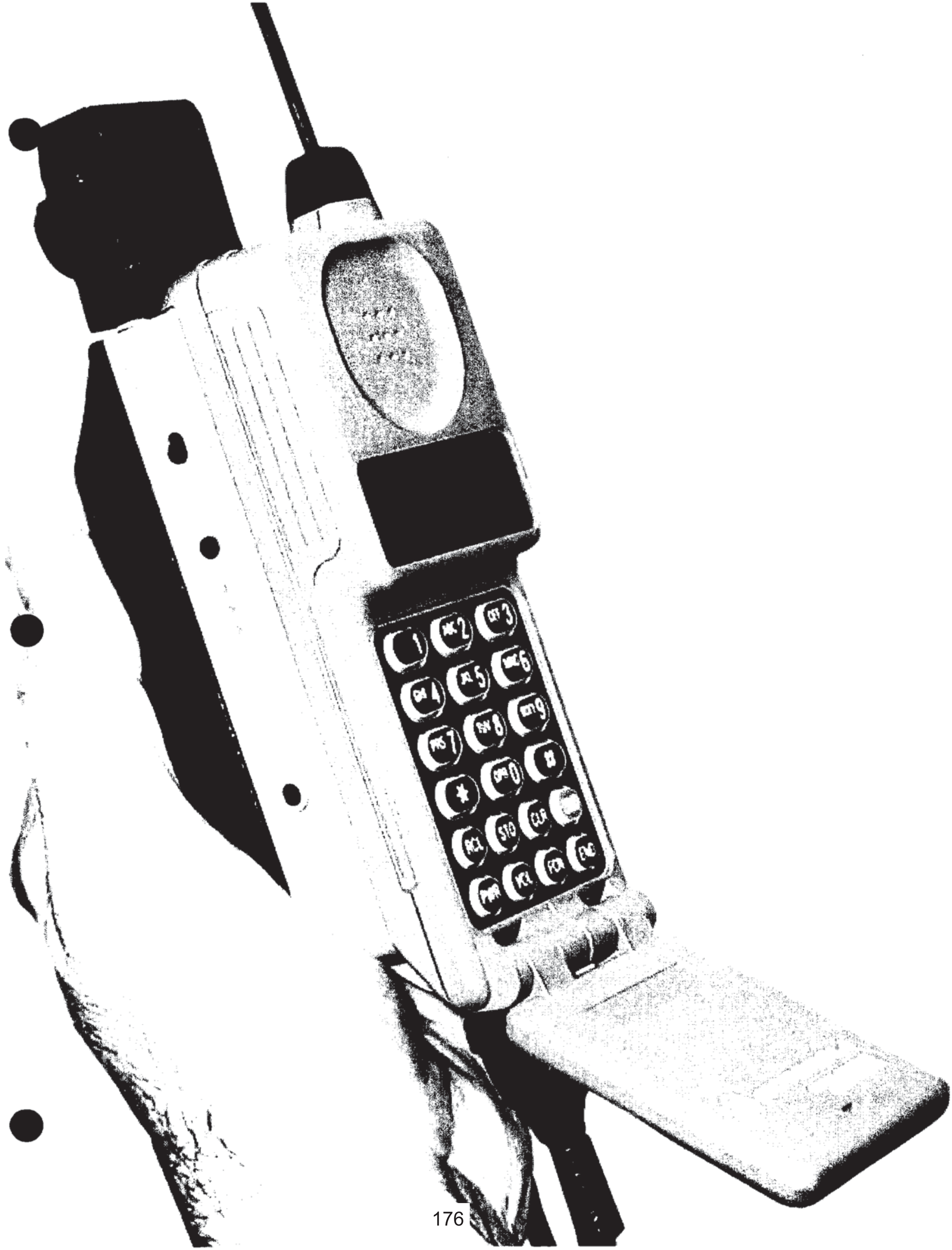
FIG. 5 Part L

PHOTOTELESIS™ PROPRIETARY
(SEE SHEET 11

Raytheon
Raytheon TI Systems
TITLE SCH DIA., PROCESSOR BOARD PUSH BUTTONS & LEDS
D PART NO. SCH-9207-001 REV PC
SCALE | FILE NAME | LAST EDIT 27OCT97 | SHEET NO. OF 9

EXHIBIT 17




1
2
3
4
5
6
7
8
9
0
RCL
STO
CLR
PWR
FCN
END