Ref.: XXXXX

OPERATION AND MAINTENANCE MANUAL
FOR
D-9322 DOWNCONVERTER

FEBRUARY 2005

CUSTOMER

MAXXXXXD
118656A

The suffix XXXXX following part numbers in this manual is a unique number assigned at time of order.

This number should be referred to in all correspondence and all referrals to spare parts.

The reference number is XXXXX.

The D-9322 (9300 Series) Downconverter (MITEQ reference XXXXX) has been supplied with the following options:

A. AC Power: XXX VAC

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SECTION 1

INTRODUCTION

1.1 GENERAL DESCRIPTION

1.1.1 PHYSICAL

The physical configuration of the D-9322 Downconverter is shown in Figures 1-1 through 1-3. The main chassis houses all RF components, control circuitry and power supplies.

The converter chassis is 19" x 22" x 3.5" panel height. Slides are provided for mounting in a standard 19" (EIA) equipment rack.

The following items are found on the front of the converter:

A. On/Off Power Switch (A1A2)

B. LO Out-of-Lock LEDs

C. Memory, Store Key

D. Memory, Recall Key

E. Display

F. Gain Adjustment Potentiometer

G. Data Entry Keypad

H. Remote Mode Select Key

The following items are found on the rear of the converter:

A. RF Input Connector (J1)

B. IF Output Connector (J2)

C. Summary Alarm Connector (J3)

D. Remote Interface Connector (J6)

E. Redundancy Switch Connector (J7)

F. Address Select Switch

G. AC Voltage Input

H. Fuse, 2.0A for 120VAC, 1.0A for 220VAC

I. Fan (A1A5)

J. Ground Lug

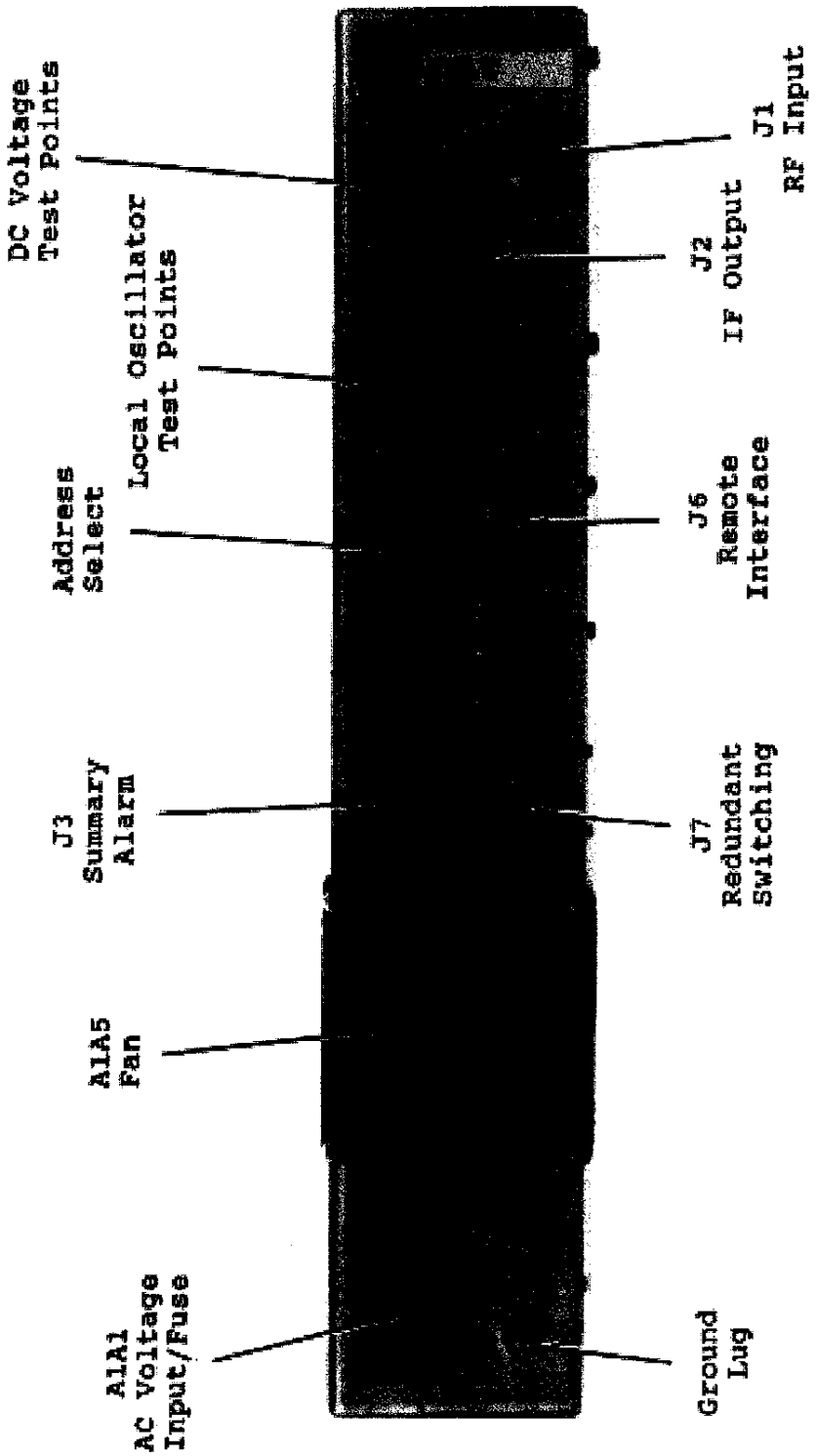


Figure 1-2. Rear View, D-9322 Downconverter

K. LO Frequency/Power Monitors

L. LO Phase Lock Voltage Test Points

M. DC Voltage Test Points

N. IF/RF Signal Monitors (Option 2)

1.1.2 FUNCTIONAL

The MITEQ 9300 Series Converter combines a state of the art communications converter with microprocessor-controlled digital circuitry to provide flexibility and convenience for the station operator.

The converter translates the 3.62-4.2 GHz frequency band to the 70 ±20 MHz output frequency band. Phase noise, amplitude flatness, group delay, and spurious outputs have been given optimum consideration to provide the user with a transparent frequency conversion for all video and data applications.

RF frequency may be selected from the front panel in 1 MHz increments. Non-volatile memory allows the operator to store up to thirty channel frequencies.

Remote operation is available via the RS485 (serial) interface. The status of the converter's functions and alarms may also be read through the remote interface (optional). Device address is selectable at the rear panel.

Relays are provided for summary alarm output which may be used for monitoring at a remote console and for redundant switching.

AC voltage input is selectable at the rear panel (100, 120, 220, 230/240VAC).

1.2 EQUIPMENT CHARACTERISTICS

1.2.1 PHYSICAL

A.	Weight:	30 pounds nominal
B.	Overall Dimensions:	19" x 22" x 3.5" panel height
C.	Signal Input Connector (J1):	N female
D.	Signal Output Connector (J2):	BNC female
E.	Summary Alarm Connector (J3):	DE-9P

F. Remote Interface Connector (J6) -

1. RS485/RS422: DE-9S

2. RS232: DB-25P

3. Contact Closure: DB-25S

4. IEEE 488: IEEE 488 receptacle

G. Redundancy Switch Connector (J7): DE-9P

1.2.2 FUNCTIONAL

A. Gain, Frequency Response -

1. Input Frequency: 3.62-4.2 GHz

2. Output Frequency: 70 ±20 MHz

3. Gain: 30 dB nominal

Gain Option No.	Nominal Converter Gain (dB)
16A	45
16C	55

4. Amplitude Response: ±20 MHz at 0.5 dB
±18 MHz at 0.4 dB

5. Gain Adjustment: 6 dB nominal (no options)
30 dB minimum (Option 3C)

B. Group Delay (±18 MHz) -

1. Standard -

a. Linear: 0.03 ns/MHz

b. Parabolic: 0.01 ns/MHz^2

c. Ripple: 1 ns peak-to-peak

C. VSWR -

1.	Input:	20 dB return loss/50 ohms
2.	Output:	26 dB return loss/75 ohms (50 ohms optional)

D. Third Order Intermodulation: For two inband signals at an output level of -10 dBm, intermodulation products 60 dBc minimum

E. Noise Figure: 12 dB maximum

F. Image Rejection: 80 dB maximum

G. Spurious -

1.	Dependent:	-65 dBc
2.	Independent:	-90 dBm inband (no options) -75 dBm inband (Option 16A) -65 dBm inband (Option 16C)

H. Frequency Selection: 3.62-4.2 GHz in 1 MHz increments

1.	Channel Memories:	30 (non-volatile)

I. Primary Power: Selectable at the rear panel (100, 120, 220, 230/240VAC)

J. Rear Panel Test Points -

1.	RF LO Phase Voltage:	Variable with frequency
2.	IF LO Phase Voltage:	10 ±2V
3.	RF LO Frequency and Power Test Point:	-15 dBm minimum, 4720-5300 MHz
4.	IF LO Frequency Power Test Point:	-15 dBm minimum, 1170 MHz
5.	DC Voltage Test Points:	+20 ±0.5V +5.2 ±0.1V +5.2 ±0.1V

K. Summary Alarm Connector (J3) Pin Designations -

1. DC Power Status -

   a. Normal: 1-2 open, 2-3 closed

   b. Fault: 1-2 closed, 2-3 open

2. Summary Alarm -

   a. Normal: 4-5 open, 5-6 closed

      DC Power Normal and Local Oscillators In-Lock

   b. Alarm: 4-5 closed, 5-6 open

      DC Power Fault or Local Oscillator(s) Out-of-Lock

L. Redundancy Switch Connector (J7) Pin Designations -

1. Normal: 1-2 open, 2-3 closed

   DC Power Normal and Local Oscillators In-Lock

2. Alarm: 1-2 closed, 2-3 open

   DC Power Fault or Local Oscillator(s) Out-of-Lock

1.3 EQUIPMENT REQUIRED

1.3.1 EQUIPMENT SUPPLIED

Table 1-1 lists the equipment supplied with each system.

TABLE 1-1

EQUIPMENT SUPPLIED

ITEM	DESCRIPTION	QUANTITY
1	Model D-9322 Downconverter	1
2	Grant SS-168NT Slides	1 Pair
3	AC Voltage Line Cord	1
4	DE-9S Connector	2
5	Remote Interface Connector	1

1.3.2 EQUIPMENT REQUIRED BUT NOT SUPPLIED

Table 1-2 lists the equipment required for periodic maintenance and calibration of the converter.

TABLE 1-2

TEST EQUIPMENT REQUIRED BUT NOT SUPPLIED

ITEM	DESCRIPTION	QUANTITY
1	Wiltron 6648A Sweep Generator (10 MHz-20 GHz)	2
2	Wiltron 560A Scaler Network Analyzer	1
3	Hewlett Packard 8495B/8494B Step Attenuator (0-81 dB)	1
4	Wiltron 60N50 VSWR Bridge (10-2000 MHz)	1
5	Wiltron 64A50 VSWR Bridge (2-8 GHz)	1
6	Wiltron 69A50 VSWR Bridge (8-18 GHz)	1
7	W and G RM4 Radio Link Measuring Set	1
8	Hewlett Packard 8566B Spectrum Analyzer	1
9	Hewlett Packard 8970 Noise Figure Meter	1
10	EIP 545A Microwave Frequency Counter	1
11	Hewlett Packard 436A Power Meter	1
12	Hewlett Packard 8405A Vector Voltmeter	1
13	Phillips PM3215 Oscilloscope	1
14	Compaq Portable Computer	1
15	SEL 488-2000, RS-232 to IEEE 488 Adapter	1
16	Fluke 6160B Reference Synthesizer	1
17	Beckman 3050 Digital Multi Meter	1

SECTION 2

INSTALLATION

2.1 UNPACKING, STORAGE, RESHIPMENT

Carefully open the shipping container and remove the equipment. Weight of the converter is approximately 30 pounds. Inspect the equipment thoroughly and report any damage.

If the equipment is to be stored, it should be wrapped in plastic and kept in a clean, dry place.

If the equipment is to be reshipped for any reason, wrap in heavy plastic and ship in a heavy (275 lb. test) double-wall carton. At least three inches of a solid packing material should be used on all sides of the converter. The carton should be marked to indicate that it contains fragile electronic equipment.

2.2 MOUNTING

The converter chassis is 19" x 22" x 3.5" panel height. Slides are provided for mounting in a standard 19" (EIA) equipment rack. The converter should be securely mounted.

2.3 TURN ON PROCEDURE

After mounting, make all external connections per Table 2-1. Refer to Section 1 for the physical configuration of the converter.

Apply power to the converter using the front panel power On/Off switch.

Allow one half hour minimum for oven warm-up in the internal crystal oscillator.

All LO fault lights should be off.

System is now operational.

TABLE 2-1

EXTERNAL CONNECTIONS

DESIGNATION	DESCRIPTION
Power Cord	Attach power cord to AC socket of converter.
RF Input	Connect RF input to J1 of converter.
IF Output	Connect IF output to J2 of converter.
Summary Alarm	Connect the summary alarm to J3 of converter.
Redundancy Switch	Connect redundancy switching to J7 of converter.
Remote Control	Connect the remote interface to J6 of converter.
Ground Lug	Be sure that the converter is well grounded.

SECTION 3

OPERATION

3.1 INTRODUCTION

The following paragraphs describe the controls, adjustments and procedures for turn on, operation, emergency operation and shut down of the converter.

3.2 CONTROLS

3.2.1 EXTERNAL CONTROLS (Figures 1-1, 1-2 and 3-1)

A. On/Off switch (A1A2) applies AC power to the converter

B. Fuse (A1A1) 2.0A for 100 and 120 VAC, 1.0A for 220 and 230/240 VAC

C. AC Power Selection (A1A1)

Voltage input is selected using a card located below the fuse on the AC input connector. The selected voltage input is indicated on the installed card. To change the voltage input, pull the card out and replace it with the desired voltage facing out. The card can be used to set the AC input voltage to 100, 120, 220, or 230/240 VAC.

D. Gain Control

The front panel potentiometer provides 6 dB minimum of gain control. If Option 3C is ordered the front panel potentiometer will provide a minimum of 30 dB gain control.

E. Data Entry Section

The keyboard is used for all numeric entry into the converter. A tone will sound for data entry error. There are two keys on the keyboard besides the standard numeric keypad and decimal point:

1. "CL" - This key is used to clear the LCD display.

2. "ENT" - This key is used to terminate commands.

F. Remote Mode Select Switch

When remote control is installed, the front panel "REMOTE" switch selects either Local (front panel) or Remote mode of operation.

G. Channel Memory

The converter has thirty memories for frequency settings numbered 00 to 29.

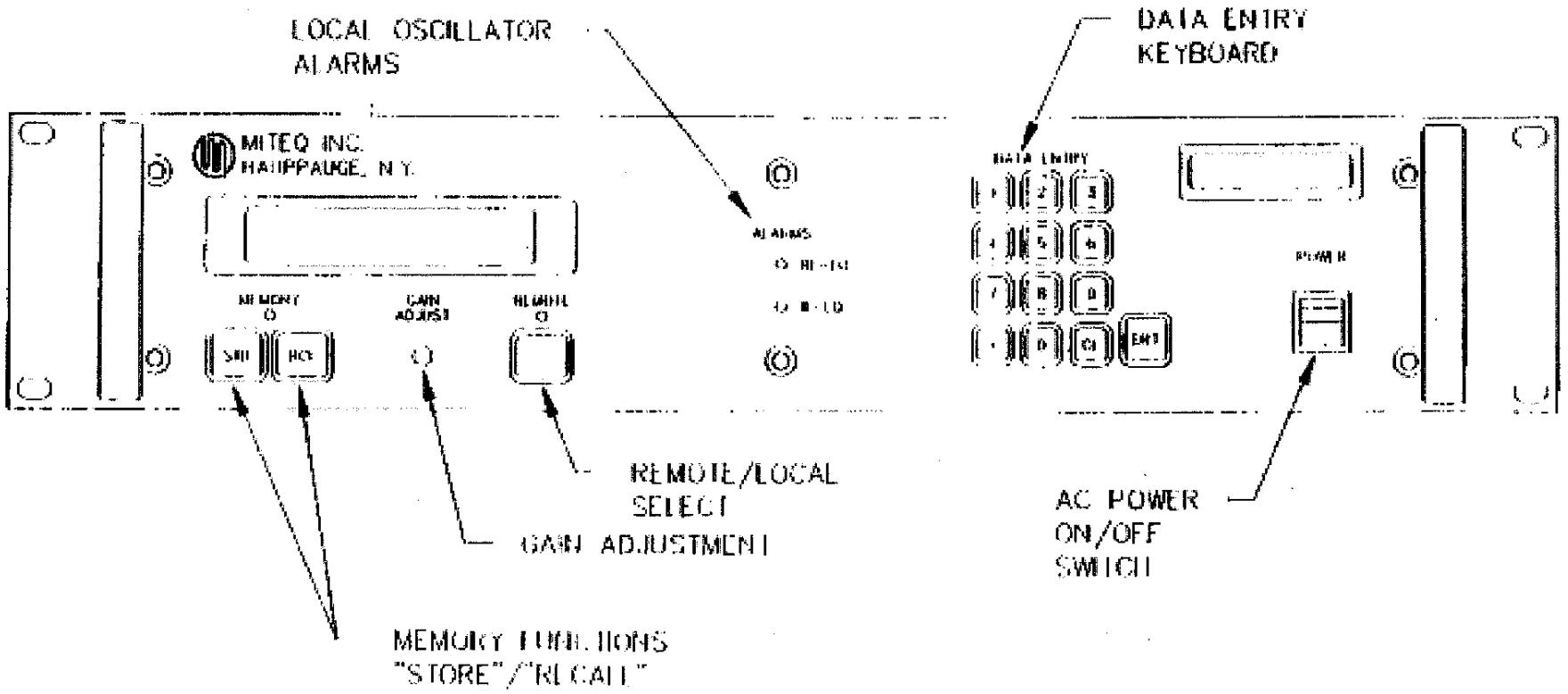


FIG. 1
FRONT PANEL LAYOUT
9300 SERIES

3.2.2 INTERNAL CONTROLS (Figure 1-3)

A. Power Supply Voltage Adjustment

Adjustment of the DC power supplies within the specified tolerances may be made using an insulated tuning tool (refer to Section 4.3.4 and Appendix) after removal of the power supply cover.

3.3 OPERATING PROCEDURE

3.3.1 LOCAL OPERATION (See Figure 3-1)

When remote control is installed, the front panel "REMOTE" switch selects either Local (front panel) or Remote mode of operation.

Depressing the "REMOTE" panel switch will place the converter in the remote operation mode. A LED on the panel will light to indicate remote mode. Commands are accepted through the rear panel remote interface connector (J6). All front panel function and data entry keys (except "REMOTE") are disabled and if pressed, will cause the error tone to sound.

To return to local operation, depress the "REMOTE" panel switch again. The LED on the panel will not be lit to indicate local mode. All command inputs are from the front panel. The unit will not accept instructions through the remote interface connector (J6) but will report frequency, mode and status.

3.3.1.1 Set Frequency. To set the frequency of the converter:

A. Enter the desired frequency (in MHz) using the numbered keys and the decimal point.

B. Press "ENT".

3.3.1.2 Channel Memory. The converter has thirty memories for frequency settings numbered 00 to 29.

To store a frequency in memory:

A. Enter the desired frequency (in MHz) using the numbered keys and the decimal point.

B. Press "STR" and enter the memory number using the numbered keys (two digits). The "MEMORY" LED will be on during the key sequence.

To recall a frequency from memory:

A. Press "RCL".

B. Enter the memory number using the numbered keys (two digits). The "MEMORY" LED will be on during the key sequence.

3.3.2 REMOTE OPERATION

When remote control is installed, the front panel "REMOTE" switch selects either Local (front panel) or Remote mode of operation (see Section 3.3.1).

3.3.2.1 RS422/485 Protocol. All transmissions are multi-byte sequences beginning with a header byte and ending with a trailer byte and checksum byte. The transmitted bytes are all ASCII printable characters in the range of 20H to 7EH.

Data transmission format is a 10 bit sequence consisting of 1 start, 7 data, 1 parity and 1 stop bit. Odd or Even parity is set from the rear panel "ADDRESS" DIP switch. All characters, including the checksum character, are checked for parity. If any character in the message has a parity, framing or overrun error, the entire message is ignored and no response is made by the converter.

All messages addressed to the converter are normally acknowledged with a response message. Before sending the response message a converter configured for RS422A will check for no activity on the communication bus for a period of at least one character time. If the bus is active, the response message will be cancelled. This allows a controller to rapidly update a number of devices on the communication bus without having to wait for a response. When using this method (available only for RS422A) the following restrictions apply:

- Minimum frequency update period is 100 msecs.
- Multiple commands may not be sent without waiting for a response from each command.

The converter continually monitors the communications bus and will accept all commands addressed to it even when in Local mode. When in Local mode, receipt of any commands other than Status All or Status Faults will be ignored and the converter will respond with an error code.

3.3.2.2 Data Transfer. The general message format is as follows:

HEADER - DEVICE ADDRESS - COMMAND/ERROR CODE - PARAMETERS (if required) - TRAILER - CHECKSUM

The response time from Command to acknowledge is 100 ms. maximum.

Since all bytes are ASCII printable characters, a compatible terminal may be used to control the converter or monitor traffic on the communication bus.

3.3.2.2.1 Header Byte. The Header byte is 7BH, ASCII character "{".

3.3.2.2.2 Device Address Byte. The Device Address may take on the values from 40H to 5FH (32 possible addresses).

3.3.2.2.3 Command/Error Codes.

COMMAND CODES

Code	ASCII Character	Function
46H	F	Frequency Set
4DH	M	Mute
41H	A	Status All
3FH	?	Status Faults

ERROR CODES

Code	ASCII Character	Function
61H	a	Command not recognized
62H	b	Illegal parameter or parameter out of range
63H	c	Unit in Local mode
64H	d	Busy

3.3.2.2.4 Parameter Bytes. Parameters are numeric characters which are sent MSD first, LSD last. Non-numeric parameters such as ",", "." or values beyond the range of the converter will be rejected and cause the converter to respond will error code "b".

3.3.2.2.5 Trailer Byte. The Trailer byte is 7DH, ASCII character "}".

3.3.2.2.6 Checksum Byte. The Checksum byte is the sum modulo 95 of all message characters beginning with the header byte up to and including the trailer byte.

The value 32 is subtracted from each character value before taking the modulo 95 sum. The value 32 is added to the final sum to obtain the Checksum value. All values are in decimal.

Checksum = Mod [(character value - 32), 95] + 32

3.3.2.3 Command Codes. The following paragraphs describe each of the command codes.

3.3.2.3.1 Frequency Code = F. The Frequency command requires a 7 or 8 digit parameter which sets the frequency of the converter in kHz. Assuming no error conditions, the converter is immediately set to the frequency.

Remote Command Sequence (8 Digit): F14000000
(7 Digit): F3705000

Converter Response: F

3.3.2.3.2 Mute Code = M. The Mute command requires no parameters. The output of the converter is muted until a Frequency command is received.

Remote Command Sequence: M

Converter Response: M

3.3.2.3.3 Status All Code = A. The Status All command requires no parameters. The converter responds in both Local and Remote mode with the converter frequency, remote/local status, mute status and component fault status.

Remote Command: A

Converter Response: AFffffffffL1Mm?abcdef

A = Status All indicator

F = Frequency indicator
fffffff(f): 7 or 8 digit ASCII numeric character indicating frequency. MSD transmitted first, LSD last.

L = Local/Remote indicator
l = "0" or "1" ASCII numeric character

0 = Local
1 = Remote

M = Mute indicator
m = "0" or "1" ASCII numeric character

0 = Mute off
1 = Mute on

? = Component Fault Status indicator

a-f = "0" or "1" ASCII numeric character

0 = No fault
1 = Fault

a through f indicates the status of the six component fault lines.

3.3.2.3.4 Status Faults Code = ? (Optional). The Status Faults command requires no parameters. The converter responds in both Local and Remote mode with the component fault status.

Remote Command: ?

Converter Response: ?abcdef

?: Component Fault Status indicator

a-f: "0" or "1" ASCII numeric character

0 = No fault
1 = Fault

a through f indicates the status of the six component fault lines.

a	Synthesizer Alarm
b	LOA Alarm
c	LOB Alarm
d	Power Supply Alarm
e	LO1 Level Detect (not available)
f	LO2 Level Detect (not available)

3.3.2.4 Device Address/Baud Rate Selection. The device address is set with a DIP switch on the rear panel. S1, 2, 3, 4 and 5 select the 5 LSBs of the address in binary (switch off = "1", switch on = "0", S1 = LSB.) The two MSBs are permanently set to "10" and not available to the user.

The baud rate and parity are selected with switches S6, 7 and 8 in the following code (switch off = "1", switch on = "0").

S8	S7	Baud Rate
0	0	1200
0	1	2400
1	0	4800
1	1	9600

S6	Parity
0	Even
1	Odd

3.3.2.5 Programming Examples. The converter address is 41H (ASCII code A). The following are typical commands and responses showing the ASCII printable characters.

A. Set the frequency to 3725.000 MHz

Controller Command	Converter Response
{AF3725000}$	{AF}a
	or possible error code
	{Ac}~

B. Status Faults Command - response indicates the synthesizer alarm is in a fault condition.

Controller Command	Converter Response
{A?}Z	{A?100000}

3.3.2.6 Remote Interface Connector.

RS422/485* -

J6-1	Ground
-3	Data Out -
-5	Data In -
-7	Data Out +
-9	Data In +

RS232 -

J6-1	Ground
-2	TX Data
-3	RCV Data
-4	RTS
-5	CTS
-7	Ground

Contact Closure -

J6-1	F14
-2	F08
-3	F05
-4	F02
-5	F01
-6	COM
-10	F06
-11	F10
-12	F12
-13	F15
-14	F16
-15	F04
-16	F03
-17	F09
-23	F07
-24	F13
-25	F11

IEEE 488 -

IEEE 488 compatible 24 contact connector (receptacle).

* For RS485 two wire party line operation DATA IN + must be externally wired to DATA OUT +, and DATA IN - externally wired to DATA OUT -.

3.3.2.7 RS422/485 Bus Termination (See Figure 3-2). Jumper selectable 120 ohm termination resistors are connected across the DATA IN +/- and DATA OUT +/- terminals. Installing E1 places the resistor across the DATA OUT terminals and E2 across the DATA IN terminals.

3.3.2.8 Contact Closure Control. Inputs to the rear panel interface connector (J6) are continuously scanned for momentary closures. When a closure is detected the converter will tune to 1 of 16 pre-selected frequencies stored in memory locations 01 through 16. This operation requires the converter to be in remote operation modes. Momentary connection of F"nn" to COM will cause the converter to tune to the frequency stored in memory location "nn".

3.3.2.9 IEEE 488 Control. The 9300 Series Converter performs the basic Talker and Listener functions as specified in IEEE Standard 488. It is also capable of sending a Service Request to the IEEE 488 controller and will respond with a status word when the Serial Poll Enable message is received.

3.3.2.9.1 Device Address/Service Request Enable. The device address is set with the ADDRESS DIP switch on the rear panel. S1, 2, 3, 4 and 5 select the address assignment in binary (switch off = "1", on = "0", S1 = LSB). Switch 8 enables the Service Request feature (switch off = disabled, on = enabled). S6, 7 are spares.

The Service Request feature is only available in converters equipped with the Status Alarm Readout option.

3.3.2.9.2 Data Input Messages. The messages to and from the converter are ASCII character strings terminated with CR, LF and EOI.

3.3.2.9.2.1 Frequency Set. The Frequency Set message sets the converter to the specified frequency in kHz and also unmutes the converter.

```
F14000500      (8 digit)
F3705000       (7 digit)
```

3.3.2.9.2.2 Mute. The Mute message mutes the RF output of the converter.

```
M
```

3.3.2.9.2.3 Set/Store Frequency in Channel nn. This message is similar to the Frequency Set message. It sets the converter to the specified frequency in kHz, unmutes the converter and stores the frequency in channel memory "nn".

```
S01F14005000     (8 digit frequency stored in Channel 01)
S25F3715000      (7 digit frequency stored in Channel 25)
```

3.3.2.9.2.4 Recall Frequency from Channel nn. This message sets the converter to the frequency previously stored in channel memory "nn". It also unmutes the converter.

```
C05  (Recall frequency stored in Channel 05)
```

3.3.2.9.2.5 Data Format. These messages determine the converter's response when it is addressed to talk by the IEEE 488 Controller. A Data Format message remains in effect until another one is received. DF is the power on default format.

3.3.2.9.2.6 Frequency Format.

Data Format	Converter Response
DF	FfffffffLlMm

F = Frequency indicator
fffffff(f) = 7 or 8 digit converter frequency in kHz

L = Local/Remote indicator
l = 0 = Local, 1 = Remote

M = Mute indicator
m = 0 = mute off, 1 = mute on

3.3.2.9.2.7 Status Faults Format.

Data Format	Converter Response
D?	?abcdef

? = Status indicator
a-f = 0 = no fault, 1 = fault

a through f indicate the status of the six component fault lines

a Synthesizer Alarm
b LOA Alarm
c LOB Alarm
d Power Supply Alarm
e LO1 Level Detect (not available)
f LO2 Level Detect (not available)

The Status Alarm readout option is required for this format.

3.3.2.9.2.8 Status All Format.

Data Format	Converter Response
DA	FfffffffLlMm?abcdef

The DA format is a combination of the DF and D? formats. The Status Alarm readout option is required.

3.3.2.9.2.9 Channel Format.

Data Format	Converter Response
DCnn	CnnFfffffffff

The DCnn format returns the frequency stored in channel nn (00-29). It has no effect on the frequency output of the converter.

3.3.2.9.2.10 Service Request. The converter will issue a service request (activate the SRQ line) when one of the status alarm lines indicate a failure. The IEEE 488 Controller responds by sending the SPE message (Serial Poll) and addresses the unit to talk. The converter responds with the following message:

Bit No.							
7	6	5	4	3	2	1	0
0	1	0	0	0	S2	S1	S0

The S"n" bits indicate in binary code which component fault line caused the service request (a = 0, b = 1, c = 2, etc.).

The IEEE 488 Controller may perform a Serial Poll without a service request being generated by the converter (the request may have been generated from another device on the bus). In this case, the response will be the same message (the data field will be the same as the last status word sent) however, bit 6 will be at "0".

3.3.3 EMERGENCY OPERATION

In the event of a failure in converter components, refer to Section 5.3 to determine possible cause/remedies.

3.3.4 SHUTDOWN PROCEDURE

The converter is completely shut down when the AC power is removed.

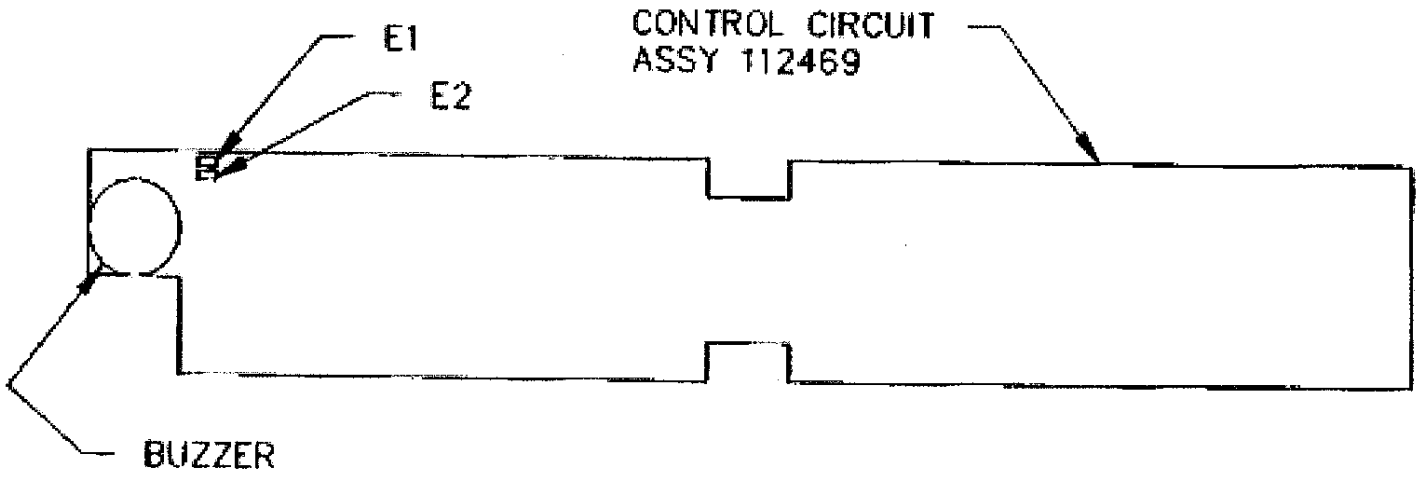


FIG. 2

RS422/485 BUS TERMINATION JUMPERS
9300 SERIES

SECTION 4

PRINCIPLES OF OPERATION

4.1 INTRODUCTION

The following paragraphs provide information on the principles of operation of the MITEQ Model D-9322 Downconverter. Overall functional operation of the system is discussed in Paragraph 4.2 and detailed principles of operation for the individual subassemblies are presented in Paragraph 4.3.

4.2 FUNCTIONAL DESCRIPTION

The converter translates a 40 MHz frequency band at 3.62-4.2 GHz to the 70 ±20 MHz output frequency band. A double conversion system is used (see Figure 4-1).

The input signal is fed to an isolator and input filter which rejects out-of-band signals including the image frequency. The 3.62-4.2 GHz signal is then converted in the first mixer to the IF frequency by use of a synthesized local oscillator signal.

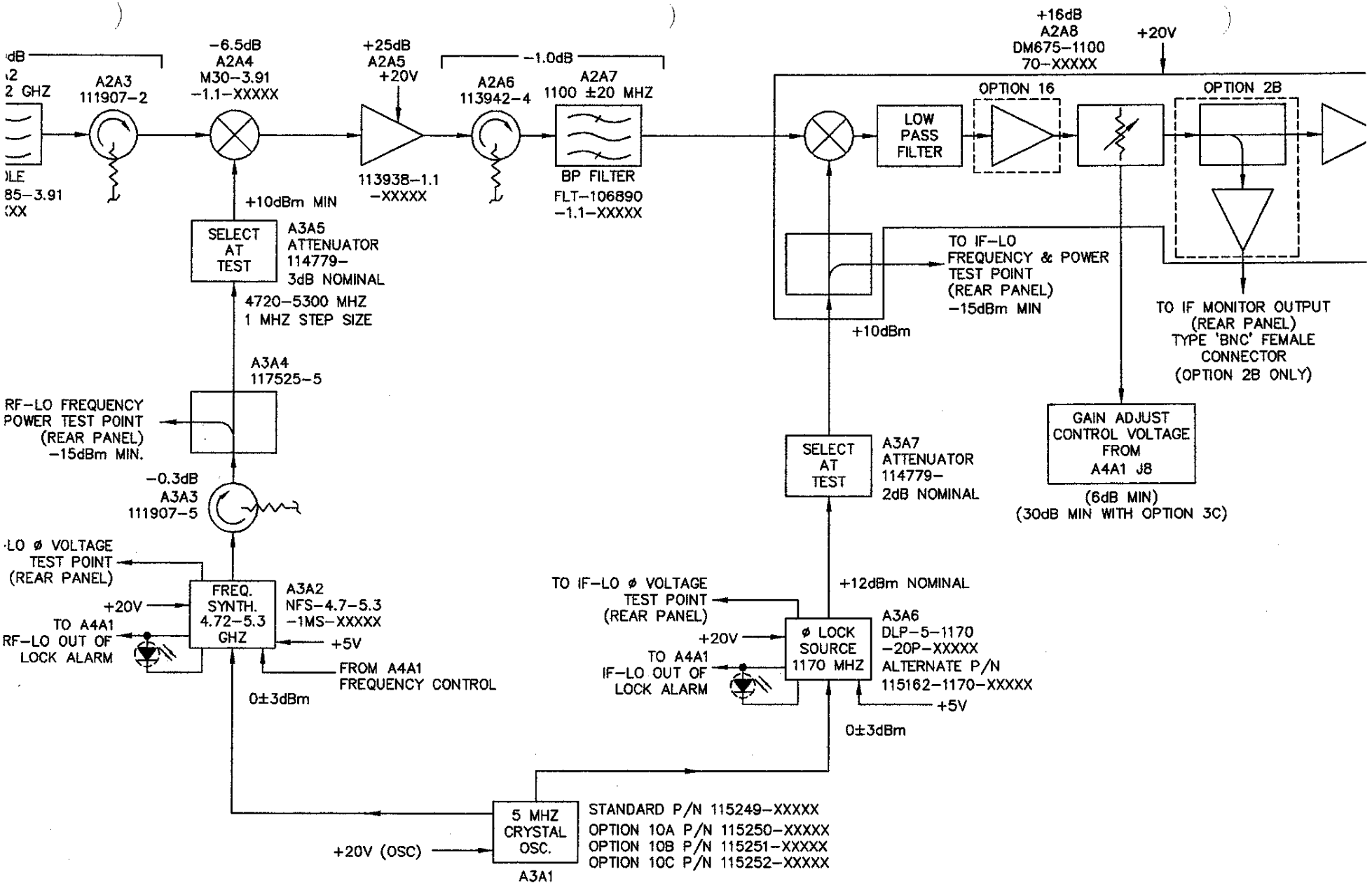
The output of the first mixer is fed to a low noise amplifier and then to a filter which rejects out-of-band signals resulting from the first conversion.

The signal is then fed to the converter module. The input signal is fed to a mixer which converts the input signal to the output IF frequency. The signal is then fed through a low pass filter, which rejects the local oscillator signal, to a PIN diode attenuator, providing gain control for the system, amplified and output from the system. If Option 16 is ordered, an additional amplifier is inserted between the filter and PIN diode attenuator. If Option 2B is ordered a coupled output port is included in the module to provide an IF test point at the rear panel of the converter.

The reference source for the local oscillator chains is a dual output high stability oven-controlled crystal oscillator at 5 MHz.

The IF local oscillator is a phase locked source which is locked to the 5 MHz reference.

The RF local oscillator is a synthesized frequency source which is locked to the 5 MHz reference.

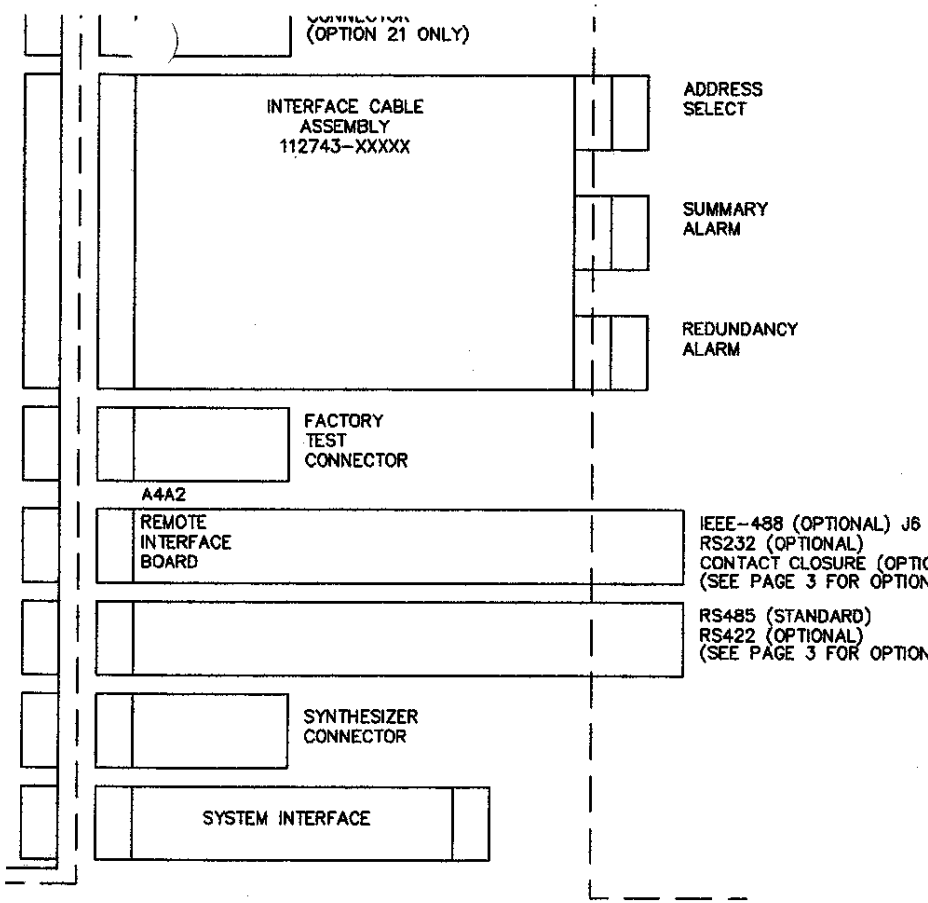


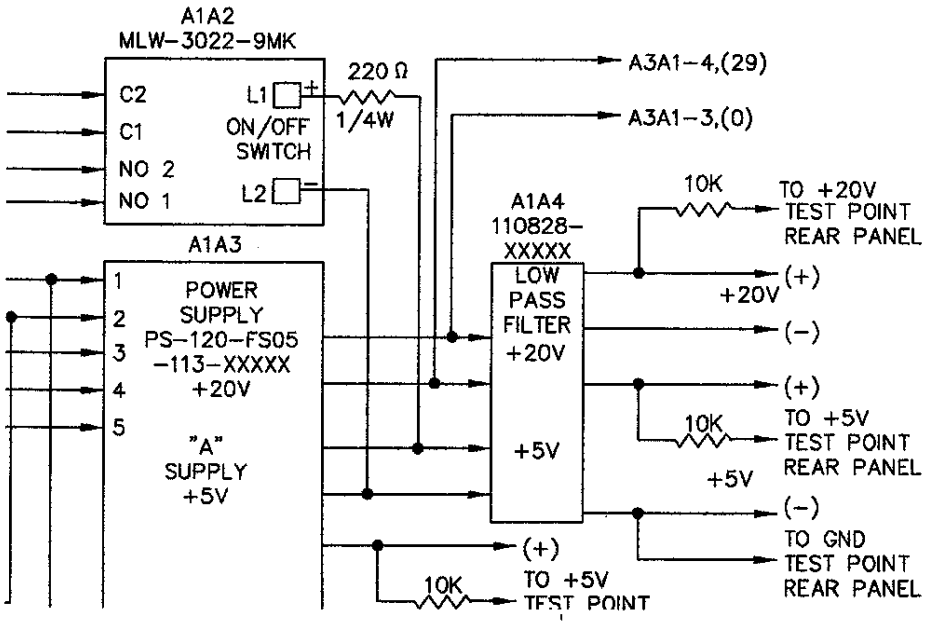
–5	–4	–3	–2	–1	NOMENCLATURE OR DESCRIPTION	SYM/NOTE
QTY REQ'D						PARTS LIST

WIRING	–

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

DRN BY | NAME | DATE





FOR OPTION 23, 5 MHZ CRYSTAL OSCILLATOR SELECTION TABLE:	
STABILITY	A3A1 PART NUMBER
STANDARD	115253-XXXXX
10A	115254-XXXXX
10B	115255-XXXXX
10C	115256-XXXXX

J7 PIN #	DESIGNATION
1	"A" MONITOR (RF)
2	IF LO LEVEL DETECT (OPTIONAL)
3	RF LO LEVEL DETECT (OPTIONAL)
4	RF LO OUT OF LOCK ALARM
5	--
6	IF LOA OUT OF LOCK ALARM
7	--
8	IF LOB OUT OF LOCK ALARM
9	--
10	GROUND
11	--
12	--
13	--
14	--
15	MUTE COIL
16	--
17	+20V MONITOR
18	+5V "B"
19	--
20	--

NOTES

1. J3 STATUS ALARM CON
   CONNECTIONS ARE AS
   A. DC POWER STATUS-
      DC POWER NORMAL
      DC POWER FAULT:
   B. SUMMARY ALARM-
      1. NORMAL:
         DC POWER NORMAL
         IN LOCK
      2. ALARM:
         DC POWER FAULT (
         OUT OF LOCK
2. PIN DESIGNATIONS ON
   CONNECTOR (J7) ARE
   A. NORMAL
      DC POWER NORMAL
      IN LOCK
   B. ALARM
      DC POWER FAULT (
      OUT OF LOCK
3. "XXXXX" IS A UNIQUE F
   AT TIME OF ORDER.

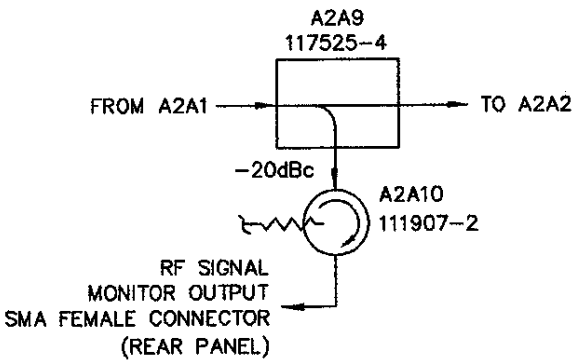
-5	-4	-3	-2	-1	NOMENCLATURE OR DESCRIPTION
QTY REQ'D					

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON DECIMALS ANGLES

DRN BY B. Tarantolay NAME 2/9

	CHANGE A2A8 P/N TO DM6C75-1100-70-XXXXX
dB MINIMUM	CHANGE A2A8 P/N TO DM3075-1100-70-XXXXX
RENCE	A3A1 P/N 115250-XXXXX
RENCE	A3A1 P/N 115251-XXXXX
RENCE	A3A1 P/N 115252-XXXXX
	CHANGE A2A8 P/N TO DM650-1100-70-XXXXX
	FOR OPTION 16 SEE INSERT PAGE 3
	OMIT A4A2 REMOTE INTERFACE BOARD, ADD CABLE BETWEEN J3 OF A4A1B AND J6
	ADD A4A2 REMOTE INTERFACE BOARD (ASSY P/N 113643-XXXXX
.OSURE	ADD A4A2 REMOTE INTERFACE BOARD (ASSY P/N 113564-XXXXX
	OMIT A4A2 REMOTE INTERFACE BOARD
	ADD A4A2 REMOTE INTERFACE BOARD (ASSY P/N 113632-XXXXX
?	CHANGE A4A1A P/N TO 115764-XXXXX CHANGE A4A1B P/N TO 115779-XXXXX

OPTION 2A



OPTION 16

OPTION NO.	DOWNCONVERTER RF/IF GAIN	DOWNCONVERTER MODULE (A2A8) GAIN	DOWNCONV PART
16A	45dB	31dB	DM616A75-
16C	55dB	41dB	DM616C75-

-5	-4	-3	-2	-1	NOMENCLATURE OR DESCRIPTION	SYM/NOT
QTY REQ'D						PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON

DRN BY NAME DATE

4.3 SUBSYSTEMS AND COMPONENTS FUNCTIONAL DESCRIPTION

4.3.1 SIGNAL PATH

4.3.1.1 Input Filter, Isolator (A2A1, A2A2, A2A3).

A2A1 -

Description: Isolator
Part Number: 111907-1
Specifications -

A. Frequency: 3.62-4.2 GHz

B. Insertion Loss: 0.3 dB

C. Input/Output VSWR: 1.1:1

D. Isolation: 23 dB minimum

E. Connectors -

1. Input: N female
2. Output: SMA female

A2A2 -

Description: Filter
Part Number: FLT-112385-3.91-XXXXX
Function: Out-of-band rejection
Design: Six pole combline
Specifications -

A. Frequency: 3.62-4.2 GHz

B. Insertion Loss: 0.3 dB

C. Input/Output VSWR: 1.2:1

D. Parabolic Group Delay: 1 nsec/500 MHz

E. Connectors: SMA male

A2A3 -

Description: Isolator
Part Number: 111907-2
Specifications -

A. Frequency: 3.62-4.2 GHz

B. Insertion Loss: 0.3 dB

C. Input/Output VSWR: 1.1:1

D. Isolation: 23 dB minimum

E. Connectors: SMA female

4.3.1.2 Mixer, First Conversion (A2A4).

Part Number: M30-3.91-1.1-XXXXX
Function: Frequency translation
Design: Double balanced
Specifications -

A. Input Frequency: 3.62-4.2 GHz

B. Output Frequency: 1100 ±20 MHz

C. LO Frequency: 4720-5300 MHz

D. Conversion Loss: 6.5 dB nominal

E. LO Power: +10 dBm

F. Isolation -

1. LO/Output: 20 dB minimum

2. LO/Input: 20 dB minimum

G. Power Output (1 dB Compression): -5 dBm minimum

H. Connectors -

1. Input: SMA male
2. Output: SMA male
3. LO: SMA female

4.3.1.3 Amplifier, Isolator, Filter (A2A5 to A2A7).

A2A5 -

Description: Amplifier
Part Number: 113938-1.1-XXXXX
Function: System gain
Design: Low noise, two stage bipolar
Specifications -

A. Frequency: 1100 ±30 MHz

B. Gain: 25 dB nominal

C. VSWR Input/Output: 1.2:1

D. Power Output (1 dB Compression): +10 dBm

E. Noise Figure: 3 dB nominal

F. DC Voltage: +20 volts

G. Connectors -

1. Input: SMA female
2. Output: SMA female
3. DC: Solder filter

A2A6 -

Description: Isolator
Part Number: 113942-4
Specifications -

A. Frequency: 1100 ±50 MHz

B. Insertion Loss: 0.5 dB

C. Input/Output VSWR: 1.1:1

D. Isolation: 23 dB minimum

E. Connectors: SMA female

A2A7 -

Description: Filter
Part Number: FLT-106890-1.1-XXXXX
Function: IF passband, out of band rejection
Design: 8 pole rod combline bandpass
Specifications -

A. Frequency: 1100 ±20 MHz

B. Insertion Loss: 1.0 dB

C. VSWR Input/Output: 25 dB

D. Parabolic Group Delay: 3 nsec ±20 MHz

E. Rejection: 45 dB ±70 MHz

F. Connectors -

1. Input: SMA male
2. Output: SMA male

4.3.1.4 Downconverter Module (A2A8).

Part Number: DM675-1100-70-XXXXX
Description: Downconverter Module
Function: Provide a well matched system output, frequency translation, gain and gain control.
Design: Integrated assembly
Specifications -

A. Frequency -

1.	Input:	1100 ±20 MHz
2.	Output:	50-90 MHz
3.	LO:	1170 MHz at +10 dBm

B. Gain: 16 dB nominal
31 dB nominal (Option 16A)
41 dB nominal (Option 16C)

C. Output VSWR: 26 dB/75 ohms
(50 ohms with Option 15)

D. Input VSWR: 23 dB/50 ohms

E. Power Output (1 dB Compression): +10 dBm minimum

F. DC Voltage: +20 volts

G. Gain Control: 6 dB minimum
(30 dB with Option 3C)

H. IF Monitor Output (Option 2B): -20 dBc nominal

I. Local Oscillator Monitor Output: -20 dBc nominal

J. Connectors -

1.	Input:	SMA female
2.	Output:	BNC female
3.	LO:	SMA female
4.	DC:	Solder filter

4.3.2 LOCAL OSCILLATOR

4.3.2.1 5 MHz Reference (A3A1).

Part Number: 115249-XXXXX

The dual output 5 MHz crystal oscillator is a highly stable precision crystal oscillator enclosed in a proportionally-controlled oven housing.

The specifications of the crystal oscillator are:

A.	Frequency:	5.000000 MHz
B.	Power Outputs:	0±3 dBm
C.	DC Power -	
	1. Warm-Up:	+20V/150 mA
	2. Normal:	+20V/70 mA stabilized at 25°C
D.	Oven Stabilization Time:	20 minutes (25°C)
E.	Connectors -	
	1. RF:	SMA female
	2. DC:	Solder filter

Refer to the index for description and data sheets for higher stability reference sources when installed (Option 10).

4.3.2.2 Frequency Synthesizer (A3A2). The microwave frequency synthesizer incorporates multiple loop, digital phase locking techniques to produce an RF output frequency in steps of 1 MHz. Phase lock loop bandwidths are adjusted for best overall phase noise performance.

Due to the complexity of the microwave synthesizer, it is recommended that all service be referred to the factory.

The specifications for the synthesized source are:

A.	Frequency Output:	4720-5300 MHz
B.	Frequency Input:	5 MHz
C.	Power Output:	+13 dBm minimum
D.	Power Input:	0±3 dBm
E.	DC Power:	+20V at 1.0A, +5V at 1.5A

F. Phase Lock TP: DC voltage variable with frequency

TM051-Rev.1

G. Connectors -

1. RF: SMA female
2. DC: "D" connector

Function	Pin
+20V	1, 6
+5V	4, 8
Ground	5, 9
Phase Voltage	2
Alarm	3

3. Control: Ribbon cable

An isolator (A3A3) and fixed attenuator (A3A5) follow the phase lock source. The isolator provides load isolation and the attenuator is used to provide level adjustment. A coupler (A3A4) is used to provide a rear panel test point frequency/power monitor of the synthesizer output.

4.3.2.3 1170 MHz Phase Lock Source (A3A6).

Part Number: DLP-5-1170-20P-XXXXX
Alternate Part Number: 115162-1170-XXXXX

The phase lock source consists of:

1. Fundamental VTO (1170 MHz)
2. Frequency divider (÷234)
3. Phase detector
4. Phase lock alarm circuit

A sample of the VTO is directed through the frequency divider and then to the phase detector. The input reference frequency is also fed to the phase detector.

When the input reference frequency and divided VTO frequency differ only in phase, the phase detector output is a DC voltage proportional to the phase difference between these two signals. A frequency difference between the two signals results in a sweep voltage which is applied to the voltage-tuned capacitor of the VTO. As the VTO is being swept through its frequency range, comparison of frequency is made in the phase detector. When the divided VTO frequency is at the same frequency as the input reference, the sweep is disabled and the VTO is locked to the input reference.

The specifications for the phase lock source are:

A. Frequency Output: 1170 MHz

B. Frequency Input: 5 MHz

C. Power Output: +12 dBm nominal

D. Power Input: 0±3 dBm

E. DC Power: +20V at 300 mA, +5V at 500 mA

F. Phase Voltage TP: 10 ±2V "in-lock", +1 or +19V "out-of-lock"

G. Connectors -

1. RF: SMA female
2. DC: Solder filter

A fixed attenuator (A3A7) follows the phase lock source and is used to provide level adjustment.

4.3.3 CONVERTER CONTROLLER

The Converter Controller board contains the microcomputer and analog circuitry necessary to control the LCD display, accept data from the front panel keys, control the frequency synthesizer, monitor status signals from the critical converter components, control the muting and alarm relays and provide a remote bus interface (e.g. RS485).

The microcomputer is designed with a microprocessor which contains on-chip RAM, a serial port and an I/O port. Program memory is stored in an EPROM. Additional RAM is located on a peripheral IC along with extra I/O ports and a timer. The I/O ports read the rear panel DIP switch for address and baud rate selection (remote bus option only), control the "MEMORY" and "REMOTE" front panel LEDs, control the muting and alarm relays and monitor the analog status alarm circuitry. The on-chip timer is used as a gated oscillator to sound the buzzer.

The I/O port on the microprocessor controls the LCD controller chips, stores and recalls data from the EEPROMs (non volatile memory) and sends serial data to the frequency synthesizer via the interface ICs. When the remote bus option is used, the microprocessor on-chip serial I/O port is used with the interface ICs to provide an RS422/485 interface.

Front panel keys are monitored by the keyboard encoder. The keys are scanned at a periodic rate and an interrupt is generated whenever a key is pressed. Key debouncing and multiple key lockout are also provided in the chip.

The power monitor IC performs three functions. A power on reset pulse is generated whenever power is turned on. As a power monitor, it continuously monitors the +5V power supply and generates a reset signal if the supply drops below 4.5V. It also contains a watch dog timer which must be periodically reset by the microprocessor. Failure to do so indicates a circuit failure and causes a reset pulse to be generated.

The analog section monitors signal levels from the critical converter components and outputs to the microcomputer whenever a fault level has been reached. Fault levels for the power supplies are fixed while others such as the LO level detect are adjusted with trim pots. A separate relay, DC alarm, is controlled from the output of the power supply monitor circuitry. The two front panel alarm LEDs, "RF-LO" and "IF-LO", are controlled from the analog circuitry.

4.3.4 POWER SUPPLY, LOW PASS FILTER

The complete manual for the power supply is given in Appendix A.

MITEQ Part Number - PS120-FS05-113-XXXXX
Power One Part Number - FS05-113

The power supply is divided into three sections:

A. +5.2 volts for the Converter Controller only
   Voltage Setting Tolerance: ±0.10 volts

B. +5.2 volts for the converter's RF components
   Voltage Setting Tolerance: ±0.10 volts

C. +20 volts for the converter's RF components
   Voltage Setting Tolerance: ±0.25 volts

Overvoltage protection is included for all sections of the power supply.

A low pass filter (A1A4) follows the RF component sections of the power supply to aid in the rejection of power supply noise. A balanced configuration is used with a series inductor and shunt electrolytic capacitor. Voltage is set and monitored after the low pass filter and is supplied to all system components with the exception of the crystal reference oscillator heater circuit. The heater circuit derives DC power before the low pass filter.

SECTION 5

MAINTENANCE

5.1 INTRODUCTION

This section includes information and instructions for periodic monitoring of converter performance, information for troubleshooting, alignment and adjustment of the converter in case of converter malfunction.

5.2 PREVENTIVE MAINTENANCE

The converter is a completely solid state design. Normal periodic inspection for cleanliness and mechanical integrity should be made in accordance with standard procedures.

To prevent long and costly downtime of the converter periodic monitoring of the overall converter performance parameters that are most indicative of the individual converter component performance is necessary. A log should be maintained that provides a permanent record of converter operation and compares it to factory provided data. By doing that, any long term degradation, erratic or abnormal performance can be detected early. The overall converter performance parameters that are most indicative of individual system component performance and encompasses all system components for correct overall converter performance are converter gain and local oscillator frequencies.

Any excessive change in converter gain indicates a malfunction in the local oscillator and/or signal channel and/or in the power supply. Any excessive frequency change indicates malfunction in phase locking to the reference oscillator.

5.2.1 DC VOLTAGE

Connect the digital voltmeter to the DC test points on the rear panel. If voltage is beyond tolerance (see Section 4.3.4), reset power supply (refer to Appendix and Figure 1-3), using the tuning adjustment on the power supply.

5.2.2 GAIN OF THE CONVERTER

The following procedure is to be followed for gain measurements. Connect the test equipment as shown in Figure 5-1. Set the sweeper to cover the required input frequency range. Set the attenuator on the log memory scope to 000 and memorize the input reference. Connect the converter into the test setup.

Record the gain and frequency response of the converter.

The gain of the converter should be periodically monitored to indicate deviations which would indicate possible malfunction.

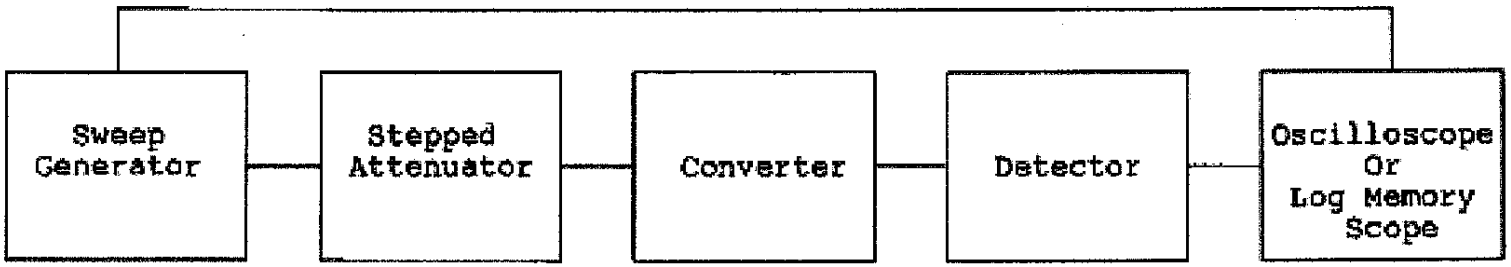


Figure 5-1. Test Setup for Gain, Gain Ripple and Frequency Response Measurement

5.2.3 FREQUENCY MEASUREMENT

Frequency accuracy of the converter is determined by the reference source used. Frequency may be monitored at the rear panel LO test points.

5.2.4 LOCAL OSCILLATOR PHASE LOCK TEST POINT (Phase Voltage)

The phase lock test point (phase voltage) of the phase lock source indicate proper locking conditions and give an indication of frequency for the basic voltage-tuned oscillator. The following voltages will be observed at 25°C ambient:

A. IF-LO: 10 ±2 volts "in lock"
1 volt or 18 volts "out-of-lock"

B. RF-LO: Variable with frequency

Due to the nature of multiple loop frequency synthesizers, the test point may not always indicate an out-of-lock state. The front panel LED represents a summary of the individual phase lock loop alarms.

Data on test point voltage should be recorded in a log and compared to the original data in order that changes in data as a function of time can be observed.

5.3 CORRECTIVE MAINTENANCE

If the converter malfunctions during its normal use or if the tests in Section 5.2 reveal excessive discrepancies in converter gain or local oscillator frequency or test point voltage, isolation and correction of the malfunction becomes necessary.

While it is difficult to fully anticipate and describe all possible failure modes in a complicated electronic system, this manual contains sufficient information in the form of theory of operation and diagrams to enable an experienced technician to isolate and remove the malfunctioning module. In addition, power supply failures can be corrected on the station level.

5.3.1 POWER SUPPLY MALFUNCTION

If the fault is detected in the power supply, remove the power supply protective cover. Check AC voltage input to the power supply. With the help of the power supply schematics in Appendix A, isolate the malfunctioning component.

5.3.2 LOCAL OSCILLATOR

To isolate the malfunctioning component in the local oscillator chain, Section 4.3.2 should first be carefully studied for theory of operation.

The following voltage check should be performed before proceeding.

Check DC voltages to phase lock oscillators. A scope (AC coupled) should be applied to voltage line to measure power supply ripple (refer to Appendix for specifications). If incorrect voltage or excessive ripple is observed, refer to Paragraph 5.3.1 for a power supply check.

Power level of the input reference should be checked. Required input reference power level for phase lock sources is 0±3 dBm.

If the reference source is significantly off frequency, the phase lock source may not be able to lock to it. Frequency of the reference should be 5.000000 MHz.

Assuming an "in-lock" condition at the correct output frequency, check output power. If unit is out of specification or above procedures fail to rectify the problem, it is recommended that unit be returned for factory repair.

5.3.3 CONVERTER, SIGNAL CHAIN

The components in the signal chain can be checked against the individual specifications listed in Section 4.3.

TABLE 5-1

PARTS LIST - D-9322 DOWNCONVERTER

ITEM NUMBER	SYMBOL NUMBER	MANUFACTURER	PART NUMBER	DESCRIPTION
1	A1A1	Corcom	6J4 (F1881)	AC Line Filter
2	A1A2	Kaiheiki	MLW-3022-9MK	On/Off Switch
3	A1A3	MITEQ	PS120-FS05-113-XXXXX	Power Supply
4	A1A4	MITEQ	110828-XXXXX	Low Pass Filter
5	A1A5	Rotron	SU2A5	Fan
6	A2A1	MITEQ	111907-1	Isolator
7	A2A2	MITEQ	FLT-112385-3.91-XXXXX	Bandpass Filter
8	A2A3	MITEQ	111907-2	Isolator
9	A2A4	MITEQ	M30-3.91-1.1-XXXXX	Balanced Mixer
10	A2A5	MITEQ	113938-1.1-XXXXX	IF Amplifier
11	A2A6	MITEQ	113942-4	Isolator
12	A2A7	MITEQ	FLT-106890-1.1-XXXXX	Bandpass Filter
13	A2A8	MITEQ	DM675-1100-70-XXXXX	Downconverter Module
14	A3A1	MITEQ	115249-XXXXX	Crystal Oscillator
15	A3A2	MITEQ	NFS-4.7-5.3-1MS-XXXXX	Synthesizer
16	A3A3	MITEQ	111907-5	Isolator
17	A3A4	MITEQ	117525-5	Directional Coupler
18	A3A5, A7	MITEQ	114779-	Fixed Attenuator
19	A3A6*	MITEQ	DLP-5-1170-20P-XXXXX	Phase Lock Source
20	*Alternate	MITEQ	115162-1170-XXXXX	Phase Lock Source
21	A4A1	MITEQ	112744	A4A1 Assembly
22	A4A1-A	MITEQ	112361-XXXXX	Front Panel Assembly

XXXXX represents a unique number assigned at time of order.

118656A

TABLE 5-

PARTS LIST - D-9322 DOWNCONVERTER

ITEM NUMBER	SYMBOL NUMBER	MANUFACTURER	PART NUMBER	DESCRIPTION
			112469-XXXXX	Control Board Assembly
			K40-8S	Address Select
			8209-6000	Summary Alarm Connector
			3631-1000	Remote Interface Connector
			8209-6000	Redundancy Alarm Connector
			112825	Chassis, 17" x 20" x 3.06"
			112361	Front Panel
			114522	RF Tray
			111404-2	Crystal Mounting (A3A1)
			8218-A-0440	4-40 x ¼" Hex Spacers 3/4" Long
			106505-5	Isolator Mounting Bracket, A2A1, A2A3
			113082-3	Isolator Mounting Bracket, A3A3
			115244	P.S. Cover
				Directional Coupler
				Ferrite Isolator
			OPTION 2A	
			117525-4	
			111907-2	
23	A4A1-B	MITEQ		
24	A4A3	TLC		
25	J3	3M		
26	J6	3M		
27	J7	3M		
28		MITEQ		
29		MITEQ		
30		MITEQ		
31		MITEQ		
32		MITEQ		
33		MITEQ		
34		MITEQ		
35		MITEQ		
36	A2A9	MITEQ		Downconverter Module
37	A2A10		OPTION 2B	
			DM6C75-1100-70-XXXXX	
38	A2A8	MITEQ		
			OPTION 3C	
39	A2A8	MITEQ	DM3075-1100-70-XXXXX	Downconverter Module

TABLE 5-1

PARTS LIST - D-9322 DOWNCONVERTER

ITEM NUMBER	SYMBOL NUMBER	MANUFACTURER	PART NUMBER	DESCRIPTION
			OPTION 10A	
			115250-XXXXX	Crystal Oscillator
			OPTION 10B	
			115251-XXXXX	Crystal Oscillator
			OPTION 10C	
			115252-XXXXX	Crystal Oscillator
			OPTION 15	
			DM650-1100-70-XXXXX	Downconverter Module
			OPTION 16A	
			DM616A75-1100-70-XXXXX	Downconverter Module, 31 dB
			OPTION 16C	
			DM616C75-1100-70-XXXXX	Downconverter Module, 41 dB
			OPTION 17C	
			113643-XXXXX	Remote Control RS232
			OPTION 17D	
			113564-XXXXX	Remote Control With Contact Closure
			OPTION 17F	
			113632-XXXXX	Remote Control IEEE 488
			OPTION 21	
			115764-XXXXX	Front Panel
			115779-XXXXX	Control Board
40	A3A1	MITEQ		
41	A3A1	MITEQ		
42	A3A1	MITEQ		
43	A2A8	MITEQ		
44	A2A8	MITEQ		
45	A2A8	MITEQ		
46	A4A2	MITEQ		
47	A4A2	MITEQ		
48	A4A2	MITEQ		
49	A4A1A	MITEQ		
50	A4A1B	MITEQ		

SECTION 6

DIAGRAMS

6.1 INTRODUCTION

This section contains the overall wiring diagram and schematics for the D-9322 Downconverter.

TABLE 6-1

LIST OF DIAGRAMS

DASH NO.	APPLICATION	
	NEXT ASSY	USED ON

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	Wiring Diagram D-9322 Downconv.	6/17/92	

THIS DRAWING INCOMPLETE WITHOUT ECN'S

LTR																														
SHEET																														
LTR																														
SHEET	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61
LTR																														
SHEET	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

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ENGR (PROJ)

APPROVAL (PROJ)

APPROVAL (GOVT)

MITEQ INC.
HAUPPAUGE, NEW YORK 11787

WIRING DIAGRAM
D-9322 DOWNCONVERTER

SIZE	CODE IDENT NO.	
A	33592	119510

SCALE

SHEET 1 OF 10

TDY POST 81079

WIRE RUN SHEET
9300 SERIES DOWNCONVERTER

MODEL:D-9322 BLOCK DIAGRAM:118656

FROM: AC LINE FILTER A1A1		
DESIGNATION	COLOR	TO
L	80	A1A2-C2
N	89	A1A2-C1
B	80	A1A2-NO 2
J	89	A1A2-NO 1
F	80	A1A3-1
D	89	A1A3-2
E	80	A1A3-3
C	89	A1A3-4
A	80	A1A3-5

FROM: POWER ON/OFF SWITCH A1A2		
DESIGNATION	COLOR	TO
C-1	89	A1A1-N
C-2	80	A1A1-L
NO-1	89	A1A1-J
NO-2	80	A1A1-B
L-1	45	A1A4 TB1-A (SW LED)
L-2	0	A1A4 TB1-B (5V GND)

FROM: POWER SUPPLY A1A3		
DESIGNATION	COLOR	TO
1	80,0	A1A1-F, A1A5
2	89,0	A1A1-D, A1A5
3	80	A1A1-E
4	89	A1A1-C
5	80	A1A1-A
+5V"A"	5	A4A1B-J1-1, A1A4 (5V Post) X2
5V"A" RTN	05	A1A4 (5V GND Post) X2
+5V"B"	59, 95	A4A1B J1-18, +5V"B"T.P.
5V"B" RTN	04	A4A1B J1-10
+20V	29 20	A1A4 (20V)X2,A4A1B J1-17 A3A1 Term. 4
20V RTN	0, 0	A1A4 (20V GND Post) X2, A3A1, Term-3

FROM: LOW PASS FILTER AND TERMINAL STRIP A1A4		
DESIGNATION	COLOR	TO
+20V INPUT	29 x 2	A1A3 +20V TERMINAL POST
20V GROUND	0 x 2	A1A3 20V RTN TERM. POST
+5V "A" INPUT	5 x 2	A1A3 +5V TERMINAL POST
5V "A" GROUND	05 x 2	A1A3 5V RTN TERM. POST
TB1-A +20V T.P.	92	+20V TEST POINT
TB1-A +20V SECTION	29	A2A5 (+20V)
TB1-A +20V SECTION	29	A2A8 (+20V)
TB1-A +20V SECTION	29	A3A2 CONN PIN-1
TB1-A +20V SECTION	29	A3A2 CONN PIN-6
TB1-A +20V SECTION	29	A3A6 (+20V)
TB1-A +20V SECTION		
TB1-A +5V T.P.	95	+5V "A" TEST POINT
TB1-A SW. LED	45	A1A2-L1
TB1-A +5V SECTION	5	A3A2 CONN PIN-4
TB1-A +5V SECTION	5	A3A2 CONN PIN-8
TB1-A +5V SECTION	5	A3A6 (+5V)
TB1-B 20V GND SECT	0	20V TEST POINT GND
TB1-B 20V GND SECT	0	A2A5 GND
TB1-B 20V GND SECT		
TB1-B 20V GND SECT	0	A2A8 GND
TB1-B 20V GND SECT	0	A3A2 CONN PIN-9
TB1-B 20V GND SECT	0	A3A6 GND
TB1-B 20V GND SECT		
TB1-B 5V GND SECT		
TB1-B 5V GND SECT		5V"A" TEST POINT GND

FROM: LOW PASS FILTER AND TERMINAL STRIP A1A4 (CONTD.)		
DESIGNATION	COLOR	TO
TB1-B 5V GND SECT	0	A1A2 - L2
TB1-B 5V GND SECT	05	A3A2 CONN PIN-5
TB1-B 5V GND SECT	05	A3A6 GND

FROM: FAN A1A5		
DESIGNATION	COLOR	TO
E1	0	A1A3-1
E2	0	A1A3-2

FROM: DC TEST POINTS		
DESIGNATION	COLOR	TO
+20 VOLTS	92	A1A4 TB1-A +20V T.P.
+5 VOLTS "A"	95	A1A4 TB1-A +5V T.P.
+5 VOLTS "B"	95	A1A3 +5V "B" POST
20V & 5V"A" GND	0	A1A4 TB1-B 20 & 5V GND SECT
RF LO ϕ VOLTAGE	19	A3A2 CONN PIN-2
IF LO ϕ VOLTAGE	69	A3A6 ϕ LO T.P.

RF TRAY CONNECTOR				
DESIGNATION	PIN	COLOR	FROM	TO

FROM: LOW PASS FILTER AND TERMINAL STRIP A1A4 (CONTD.)		
DESIGNATION	COLOR	TO
TB1-B 5V GND SECT	0	A1A2 - L2
TB1-B 5V GND SECT	05	A3A2 CONN PIN-5
TB1-B 5V GND SECT	05	A3A6 GND

FROM: FAN A1A5		
DESIGNATION	COLOR	TO
E1	0	A1A3-1
E2	0	A1A3-2

FROM: DC TEST POINTS		
DESIGNATION	COLOR	TO
+20 VOLTS	92	A1A4 TB1-A +20V T.P.
+5 VOLTS "A"	95	A1A4 TB1-A +5V T.P.
+5 VOLTS "B"	95	A1A3 +5V "B" POST
20V & 5V"A" GND	0	A1A4 TB1-B 20 & 5V GND SECT
RF LO ϕ VOLTAGE	19	A3A2 CONN PIN-2
IF LO ϕ VOLTAGE	69	A3A6 ϕ LO T.P.

RF TRAY CONNECTOR				
DESIGNATION	PIN	COLOR	FROM	TO
+20V OR MUTE (MOD)	1	29	A2A8	A1A4 TB1-"A" (+20V SECT)
+20V OR MUTE	2	29	A2A5	A1A4 TB1-"A" (+20V SECT)
RED	3	2	A2A8 (20V)	A4A1B J8-2
WHITE (GC)	4	9	A2A8 (GC)	A4A1B J8-3
BLACK (GC)	5	0	A2A8 GND	A2A1B J8-4
20V GND	6	0	A2A8 GND	A1A4 TB1-"B" (20V GND)
20V GND	7	0	A2A5 GND	A1A4 TB1-"B" (20V GND)

FROM: IF MODULE A2A8		
DESIGNATION	COLOR	TO
+20 VOLTS	29	RF TRAY CONN PIN-1
+20 VOLTS	2	RF TRAY CONN PIN-3
GROUND	0	RF TRAY CONN PIN-6
GAIN CONTROL	9	RF TRAY CONN PIN-4
GROUND	0	RF TRAY CONN PIN-5

FROM: AMPLIFIER A2A5		
DESIGNATION	COLOR	TO
+20 VOLTS	29	A1A4 TB1-"A" 20V SECT
GROUND	0	A1A4 TB1-B 20V GND

FROM: CRYSTAL OSCILLATOR A3A1		
DESIGNATION	COLOR	TO
+20 VOLTS (OSC)	20	A1A3 (+20V POST)
+20 VOLTS (HTR)		
GROUND	0	A1A3 (20V GND POST)

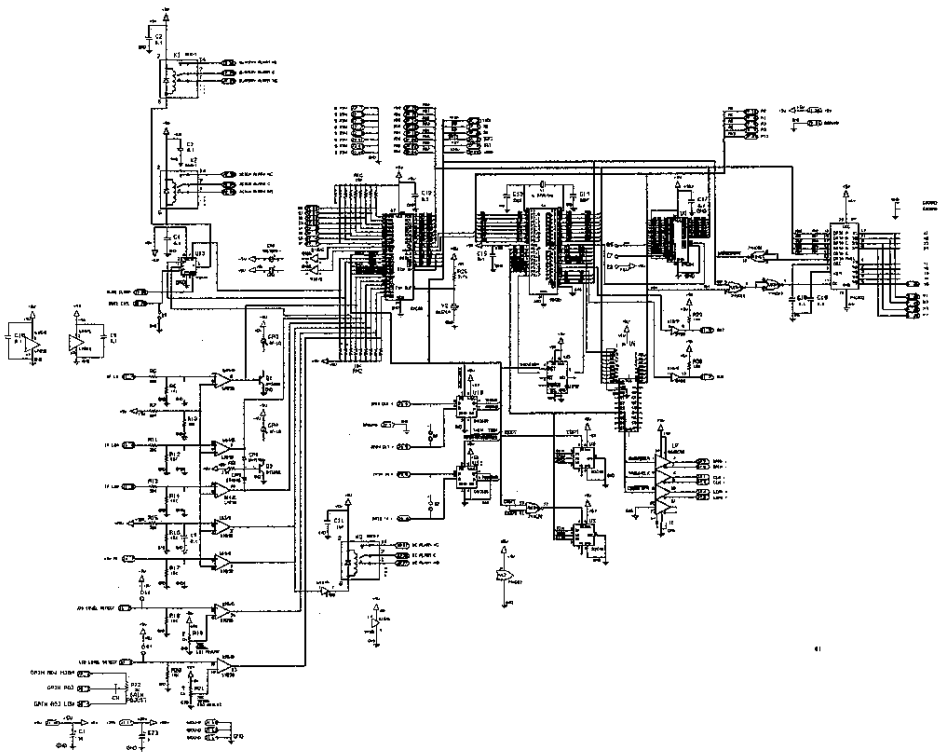
FROM: PHASE LOCK SOURCE A3A6		
DESIGNATION	COLOR	TO
+20 VOLTS	29	A1A4 TB1-A (20V)
GROUND	0 05	A1A4 TB1-B 20V GND SECT " " 5V GND SECT
ϕ LOCK TEST POINT	69	IF TEST POINT (REAR PANEL)
EXTERNAL LED-A	93	A4A1B-J1-6
EXTERNAL LED-K	0	A1A4 TB1-B 20V GND
+5 VOLTS	5	A1A4 TB1-A 5V SECT

FROM: FREQUENCY SYNTHESIZER A3A2			
DESIGNATION	PIN	COLOR	TO
+20 VOLTS	1	29	A1A4 TB1-A (20 V SECT)
TEST POINT	2	19	RF TEST POINT (REAR PANEL)
ALARM LED	3	91	A4A1B J1-4
+5 VOLTS	4	5	A1A4 TB1-A (+5V SECT)
5 VOLT GROUND	5	05	A1A4 TB1-B (5V GND)
+20 VOLTS	6	29	A1A4 TB1-A (+20V SECT)
N/C	7		
+5 VOLTS	8	5	A1A4 TB1-A (+5V SECT)
20 VOLT GROUND	9	0	A1A4 TB1-B (20V GND)

GAIN ADJUST POTENTIOMETER			
DESIGNATION	COLOR	FROM	TO
C.W.	2	A4A1B J8 PIN 2	A2A8(+20V)
C.T.	9	A4A1B J8 PIN 3	A2A8 (G.C)
C.C.W	0	A4A1B J8 PIN 4	A2A8 (GND)

FROM: 9300 SERIES CONTROL BOARD A4A1B			
DESIGNATION	J1 PIN	COLOR	TO
+5V"A" MON. (RF)	1	5	A1A3 (+5V "A" POST)
IF LO LEVEL DET.	2		
RF LO LEVEL DET.	3		
RF LO ALARM	4	91	A3A2 CONN PIN 3
IF LOA ALARM	6	93	A3A6 EXT. LED-A
TTL SWITCH CONT.	7		
IF LOB ALARM	8		
GROUND	10	04	A1A3 (5V"B" POST)
MUTE COIL	15		
+20V MONITOR	17	29	A1A3 (+20V POST)
+5V "B"	18	59	A1A3 (+5V "B" POST)
DESIGNATION	J8 PIN	COLOR	TO
+20 VOLTS	2	2	A2A8(+20V)
GAIN ADJ. VOLTAGE	3	9	A2A8(G.C.)
GAIN ADJ. COMMON	4	0	A2A8(GND)
DESIGNATION	J9 PIN	COLOR	TO
ATTEN. CONTROL	1		
ATTEN. RETURN	2		

ZONE	LTR	DESCRIPTION	DATE	APPROVAL
	M	REDRAWN	12/1/94	



NOTES: UNLESS OTHERWISE NOTED
1. ALL RESISTORS VALUES ARE IN OHMS, 1/10W.
2. ALL CAPACITOR VALUES ARE IN PICOFARADS.
3. ALL INDUCTORS VALUES ARE IN MICROHENRIES.

ARTWORK	402551	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON	
ASSEMBLY	112463	DECIMALS ANGLES .XX ± .01 .XXX ± .005 ±1°	
		MATERIAL	
		FINISH	
NEXT ASSY	USED ON	HEAT TREAT	
APPLICATION			

MITEQ

SCHEMATIC DIAGRAM
FA PNL CONV CONT
9300 SERIES

SIZE	CODE IDENT. NO.		REV.
D	33592	112323	M

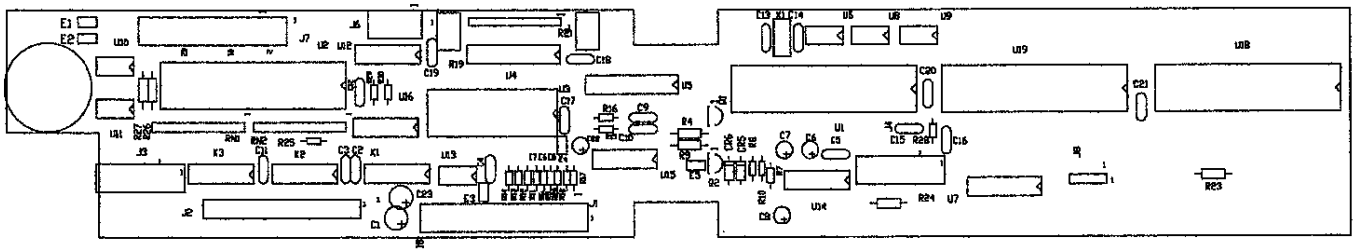
SCALE NONE | REV | REVISION | SHEET 1 OF 1

J MOVE RY3 AND J4 .05 ON X
ADDED CONNECTION U6 PIN6 --U10 PIN3
INCREASED ALL PAD SIZE

K REV: ARTWORK U18--20 W/GND.
CLEAR +5V FROM INT LYR, REVISED SILKSCREEN
ON WIRING SIDE, INCR MTG PAD.

L ADDED J7 PIN 3

M SHT 3: REVISED HOLE COUNT NEAR POT



SCHEMATIC 112323
ARTWORK 402531

4-10-90

ASSY/DRILLING
FRONT PANEL
CONTROLLER

112469

ORIGINAL

DEC 04 1986

POWER SUPPLY DATA SHEET

DWG # 56661 H/R

WORK ORDER _____ MODEL FS05-113 QUANTITY _____ DATE _____

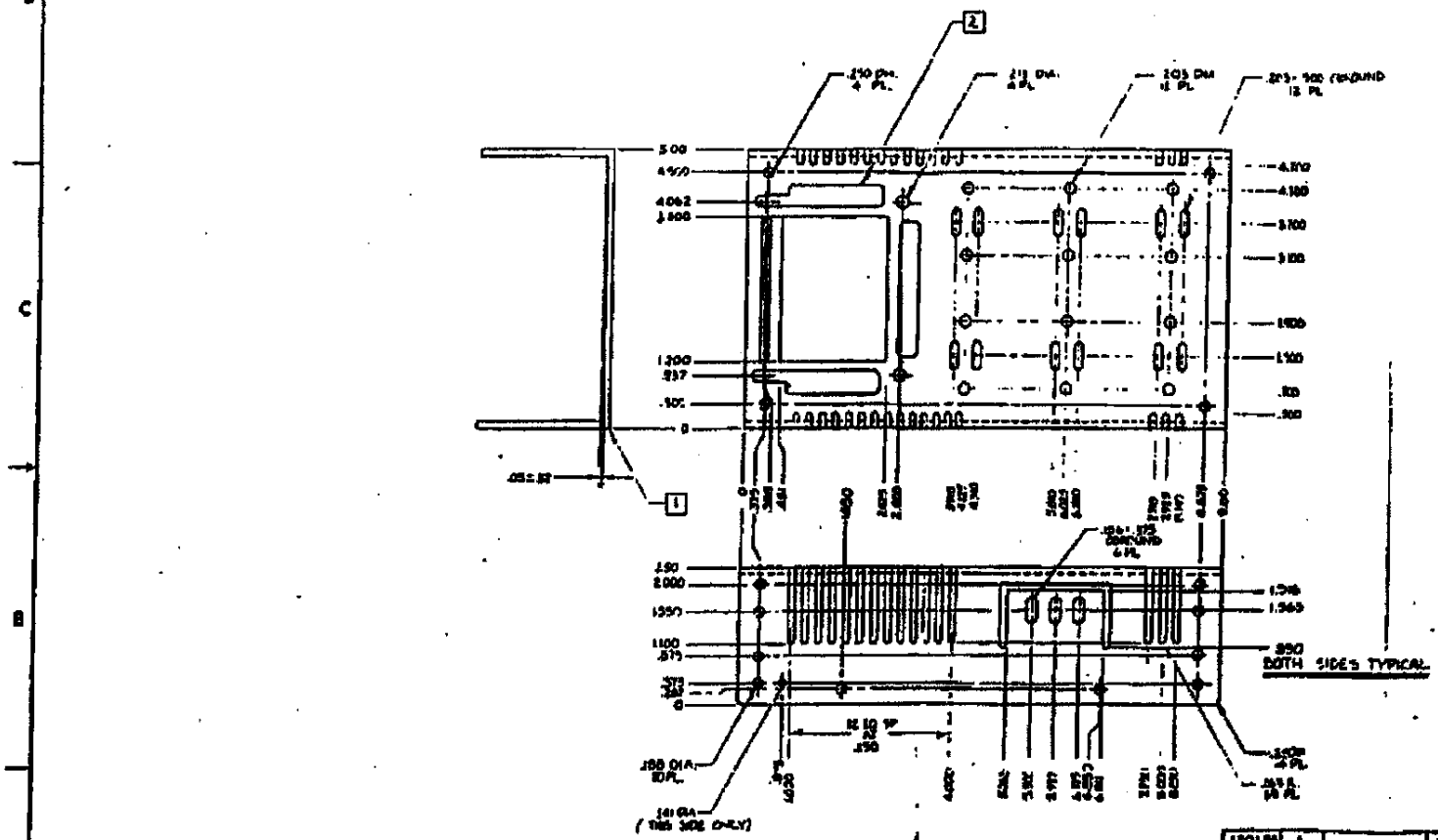
CUSTOMER MITEQ TESTED BY: _____ Q.C. _____

PARAMETER	TEST RESULTS	ACCEPTANCE LIMITS	TEST RESULTS	ACCEPTANCE LIMITS	TEST RESULTS	ACCEPTANCE LIMITS	TEST RESULTS	ACCEPTANCE LIMITS
LINE REG. 110 -132 VAC		≤ 20mV		≤5mV		≤ 5mV		
0-100% LOAD REG. AT 110VAC		≤20mV		≤5mV		≤5mV		
CURRENT LIMIT AT 132VAC		.4 TO 4.6 AMPS		.4 TO 4.6 AMPS		2 TO 2.5 AMPS		
SHORT CIRCUIT CURRENT AT 132VAC		0.5 TO 1.3 AMPS		0.5 TO 1.3 AMPS		0.25 TO 0.75 AMP		
RIPPLE CONTENT P/P		≤5 mV		≤5mV		≤5mV		
OVP TRIP POINT		22.5 TO 25.5 VDC		5.7 TO 6.7 VDC		5.7 TO 6.7 VDC		
DROP OUT VAC		≤108 VAC +20.03 ±.03VDC		≤108 VAC		≤108 VAC		
OUTPUT AT 115VAC FULL LOAD	____V @ 3.3 AMPS	+20 ±.05 VDC @ 3.3 AMPS	____V @ 3.3 AMPS	A' +5.025 ±.025 VDC @ 3.3 AMPS	____V @ 1.5 AMPS	B' +5.025 ±.025 VDC @ 1.5 AMPS		
NOTE:	1.) TEST PER PSTS-01.							

REVISIONS					APPROVALS	DATE
ECO	LTR	DESCRIPTION	DATE	APPROVED	DRAWN:	8-8-86
—	IVR	RELEASED TO PROD	12-3-86		CHECKED:	12-3-86
					APPVD:	12-3-86

Power-One D.C. Power Supplies

SHEET 1 OF 1



ORIGINAL

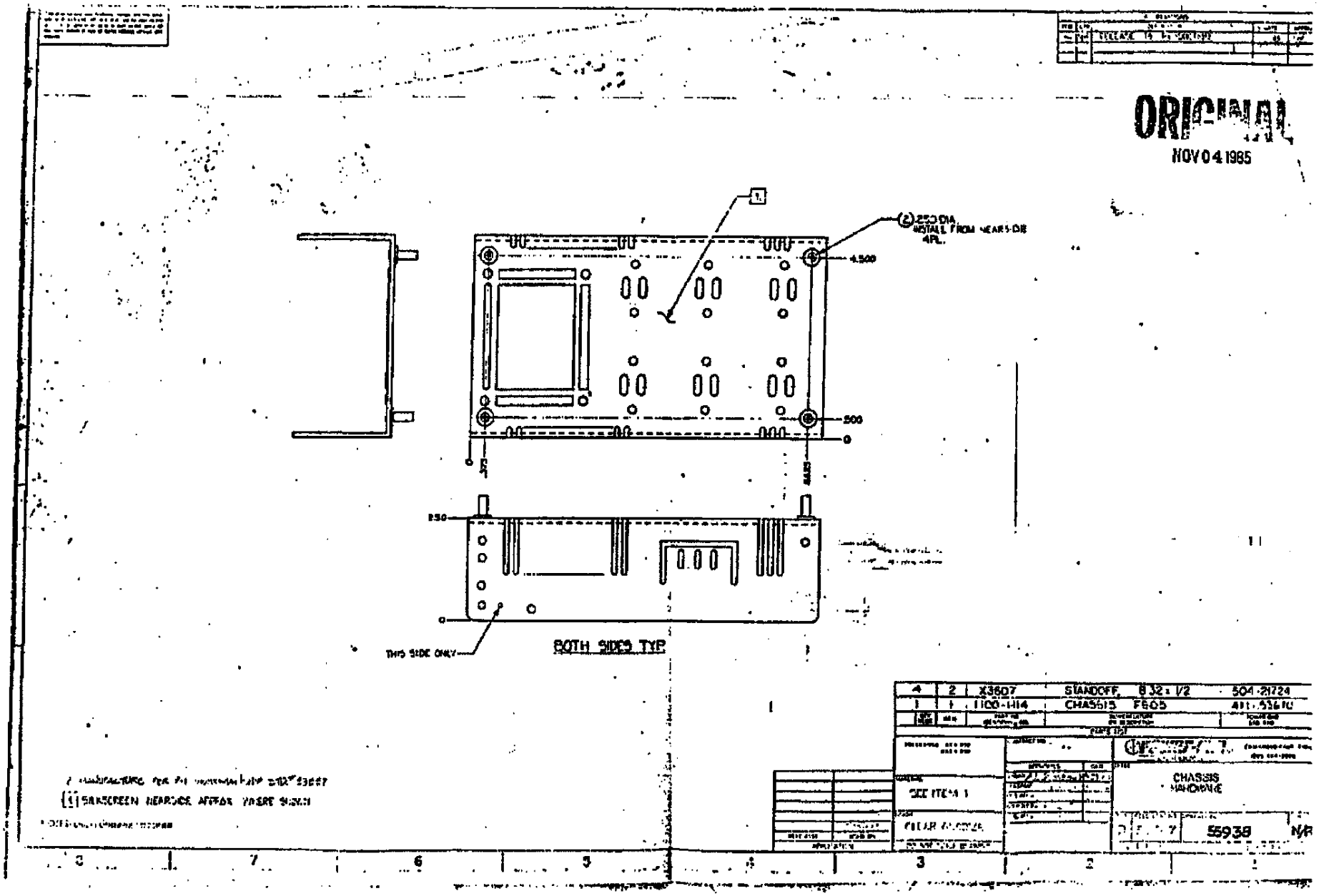
OCT 11 1985

NOTES:
2. USE RIDGE DIE TO FORM (LOCATE FROM XFMR MTG HOLES)
1. ALL BENDS TO BE 90° ±1°, USE SHARP RADIUS WHEN FORMING.

power-one

CHASSIS

D | 54407 | 53670 | C


ORIGINAL
NOV 04 1985
4.500
.500
0
.250
.250
BOTH SIDES TYP
THIS SIDE ONLY
4 2 X3607 STANDOFF, 8-32 x 1/2 504-21724
1 1 1100-1114 CHASSIS F605 611-53610
CHASSIS
55938
N/R

TO BE SILKSREENED IN BLACK INK

POWER-ONE D.C. POWER SUPPLIES

CHASSIS SILKSCREEN

MODEL NO. F505-113

CONTRACT NO.	
APPROVALS	DATE
DRAWN	6-19-86
CHECKED	11-3-86
ISSUED	11-4-86

SIZE	NO. OF PCS.	DWG. NO.	REV.
A	1	A56662	N/R
SCALE 1:1		SHEET 1 of 1	

REVISIONS

ECO	LTR	DESCRIPTION	DATE	APPROVED
—	N/R	RELEASED TO PRODUCTION		

ORIGINAL

DEC 04 1986

POWER-ONE D.C. POWER SUPPLIES F505-113

OUTPUT: +20VDC AT 3.3AMPS W/OVP
'A' + 5VDC AT 3.3AMPS W/OVP
'B' + 5VDC AT 1.5AMPS W/OVP

Q3

AC INPUT, 47-63Hz				
FOR USE AT	100	120	220	230/240
JUMPER	1&2, 2&4	1&3, 2&4	2&3	2&3
APPLY AC	1&5	1&4	1&5	1&4
MAX CURRENT/ FUSE RATING	2 AMPS/ 250V		1 AMP/ 250V	

Q2

EXTERNAL FUSE REQUIRED
EXT

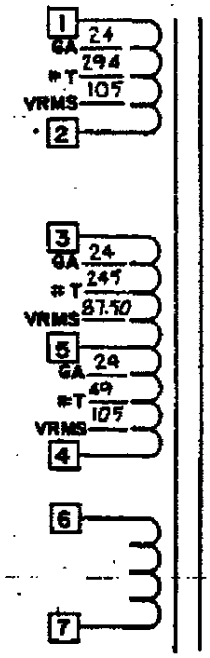
MADE IN USA

ORIGINAL

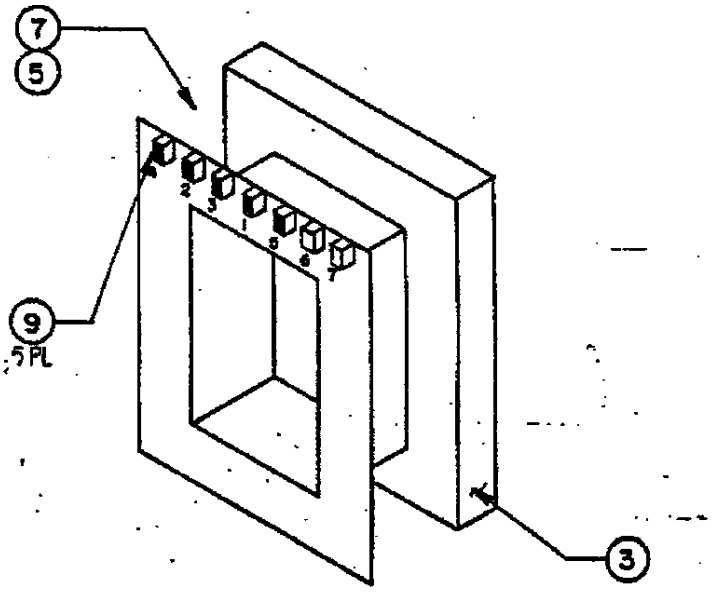
MAY 01 1986

WINDING NUMBER	1	2	3	4
WIRE-GAUGE,TYPE	24 NLZ	24 NLZ		
PART NUMBER	260-0141	260-10141		
TOTAL TURNS	294	294		
TAP	—	49		
LEAD NUMBERS	1-2	3-5-4		
INT. BOBBIN WIDTH	.651	.651		

REVISIONS			
LTR	DESCRIPTIONS	DATE	APPD
A	RELEASE TO PROD.	3/16/83	AK
B	INC. ECO B668	4/11/83	



SCHEMATIC



ITEM	QUANTITY	DESCRIPTION	STD. PART NO.
10			
9	5 EA.	TERMINALS	250-50417
8			
7	.75 FT.	TAPE	240-20967
6			
5	.5809 LBS.	WIRE # 24 NLZ	260-10141
4			
3	1 EA.	BOBBIN, EI 125 x 1.60	200-50477
2			
1			

INPUT: 100/120/220/240 VAC +10% -13%
47-63 HZ

NOTES:

		APPROVALS	DATE
	CP323	DRAWN Dan Varano	5/15/81
	HN 24/28	CHECKED	6/24/81
	HN 12/15	ENG. APPD.	9/21/81
	HN 7	APPROVED	
USED ON		MFG. APPD.	7-17-81

POWER-ONE
D.C. POWER SUPPLIES

(805) 484-2806
740 CALLE PLANO
CAMARILLO, CA. 93010

TITLE

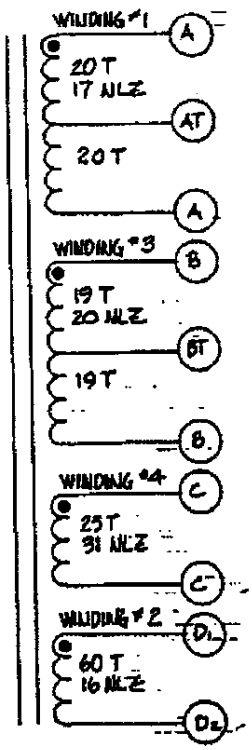
TRANSFORMER
PRIMARY - SUB ASSEMBLY

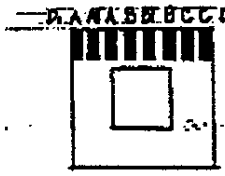
SIZE	IDENT. NO.	DWG. NO.	REV.
B	54407	50633	B

SCALE —— SHEET 1 OF 1

FILL FACTOR : 87 %

R	ECO	DESCRIPTION	DATE	APPR
NR		RELEASED TO PRODUCTION	[illegible]	[illegible]



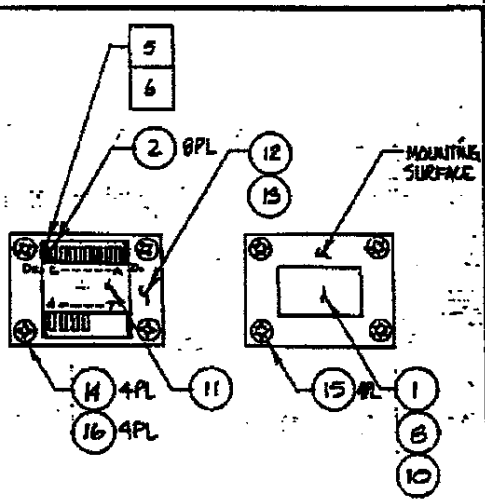


6. D.D. NOT SHOWN ON THE LABEL. LEADS TO BE TERMINATED AS SHOWN.

5. D1, D2 TO BE CURLED SELF-LEADS.

4. VARNISH PER PS01001.
3. MARK PER PS01002.
2. TAPE PER PS01004.
1. MANUFACTURE PER POWER-ONE WORKMANSHIP STD. 33857.

NOTES:



ITEM	QTY	DESCRIPTION	P/N
17	.0798 LBS	WIRE, 20 AWG	260 -1013
16	4	WASHER	391 -1020
15	4	NUT, PRESS	340 -1029
14	4	SCREW, 8-32 X 2 1/8"	353 -2129
13	.0761 LBS.	LAMINATION KEEPER	220 -1017
12	4.00 LBS.	LAMINATION, M9, 24GA	231 -1016
11	1	LABEL PLATE	274 -5061
10	1	HOUSING	200 -5047
9	1	SECONDARY COIL	092 -7666
8	1	PRIMARY COIL	091 -5061
		ASSEMBLY, XFMR	082 -7661
7	.0043 LBS.	WIRE, 31 AWG	260 -1014
6	.1676 LBS	WIRE, 17 AWG	260 -1015
5	.3176 LBS.	WIRE, 16 AWG	260 -1013
4	—	TAPE C43" LEAD-OUT	240 -2054
3	—	TAPE 0.95"	240 -2094
2	8	TERMINAL SECONDARY	250 -5041
1	1	BOBBIN, EI 125 X 1.6	200 -5041
		SECONDARY COIL	092 -7661

APPLY 105 VAC AT TERMINALS 1:2

HY POT		VOLTAGE RATIO TEST—PRIMARY TERMS						APPROVALS	DATE
TERMS	VOLTS	TERMS	VOLT	TERMS	VOLT	TERMS	VOLT		
PRI-PRI	500 VAC	3-5	87.50	C-C	8.92			Ray Rodriguez	8-11-88
PRI-SEC	3750 VAC	3-4	10.5	D1-D2	21.42				12-1-7
PRI-GND	5750 VAC	A-AT	7.14						12-5-88
SEC-GND	1500 VAC	A-A	14.28						5-2-89
		B-BT	6.78						
		3-B	13.57						

POWER-ONE
U.S. POWER SUPPLIES

USED ON: FS05-113

TITLE: TRANSFORMER

DWG. NO. 56663 REV N

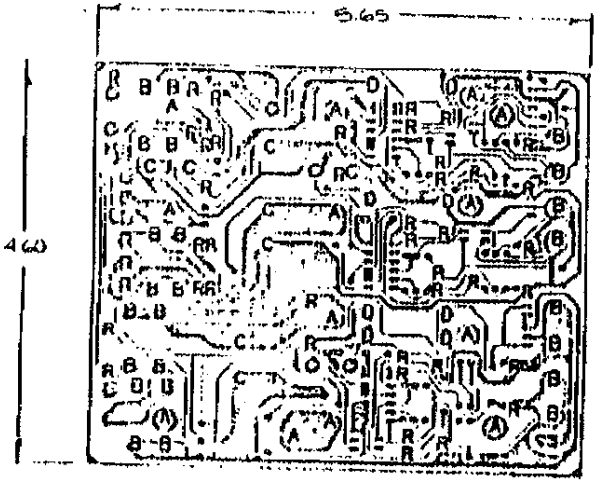
SCALE: — SHEET 1 OF 1

DEC 04 1989

ORIGINAL

DEC 04 1986

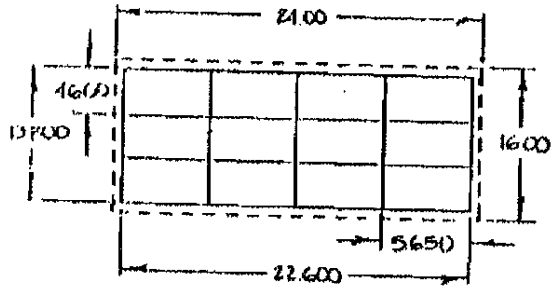
REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
	[illegible]	RELEASE TO PRODUCTION		



HOLE LEGEND	
IDENT.	QTY.
A	13
B	24
C	14
D	8
E	5
H	170
R	46
J	---
K	---
L	---
M	---

2.

FOR HOLE DIA. REFER TO DWG. 16328



3 MANUFACTURE PER P-1 SPECIFICATION P50100.

2 ALL UNMARKED HOLES TO BE "H" HOLES.

1 FOR PWB HARDWARE, SEE APPROPRIATE PARTS LIST.

NOTES: UNLESS OTHERWISE SPECIFIED

QTY REQD	ITEM	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION
AR	1		.063 BLK EPOXY GLASS 1/0 OZ FR 4	509-21674

PARTS LIST

NEXT ASSY	USED ON
	P505-113

TOLERANCE .XX = .010
.XXX = .005

MATERIAL: SEE ITEM 1.

FINISH

APPROVALS	DATE
DRAWN ETL	11-10-86
CHECKED [illegible]	11-3-86
ENG. APPR.	
APPROVED [illegible]	11/3/86
MFG. APPR. [illegible]	11-3-86

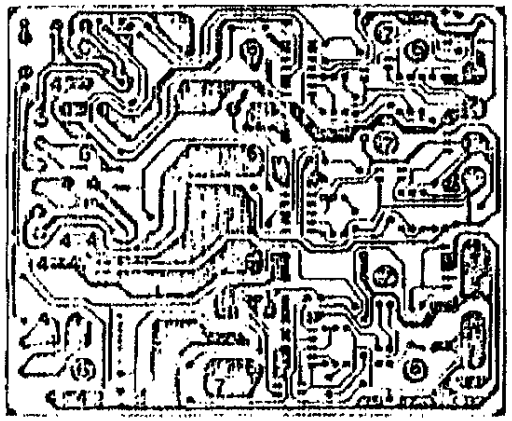
Power-one
CAMARILLO, CALIF. 93010
(805) 484-2806

TITLE: P.W.B. DRILL

SIZE	CODE IDENT. NO.	DRAWING NO.	
C	54407	56664	N/R

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
—	A	RELEASE TO PRODUCTION		

DEC 04 1986



IDENT	QTY	POWER-ONE P/N	DESCRIPTION	INSTALLATION
1	8	502-10227	EYELET,.081OD x .155L	FARSIDE
2	8	503-10998	TERM DUAL TUR MACH.	FARSIDE
3	--	503-13596	TERM. SGL.TUR.ROLLED .180 O.D x .204 LONG	FARSIDE
4	16	503-10224	TERM DUAL TURRET .180 O.D x .320LONG	FARSIDE
5	--	503-10222	TERMINAL #0 FASTON	FARSIDE
6	2	504-10223	STANDOFF,THRD3/16L	NEARSIDE
7	4	504-10223	STANDOFF,THRD3/16L	FARSIDE
8	--	504-20119	SPACER,6 CLEAR x .188	FARSIDE
9	--	502-20602	CAP EYELETS	NEARSIDE
10	--	312-10226	FUSE CLIP	FARSIDE
11	6	901-21242	CAGE JACK	NEARSIDE
12	--	504-21317	STANDOFF, CAP	FARSIDE
13	--	901-21322	CAGE JACK(DIODE,SCR)	NEARSIDE
14				
15				

NOTES: UNLESS OTHERWISE SPECIFIED

QTY REQD	ITEM	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL OR SUBSTITUTE
1	1		PWB DRILL	506-54464

PARTS LIST

NEXT ASSY	USED ON
	FS05-113

APPLICATION

TOLERANCE .XX = .010
.XXX = .010

MATERIAL

FINISH

DO NOT SCALE DRAWING

APPROVALS	DATE
DRAWN	11-19-86
CHECKED	11-21-86
ENG APPD.	
APPROVED	12/1/86
MFG APPD.	

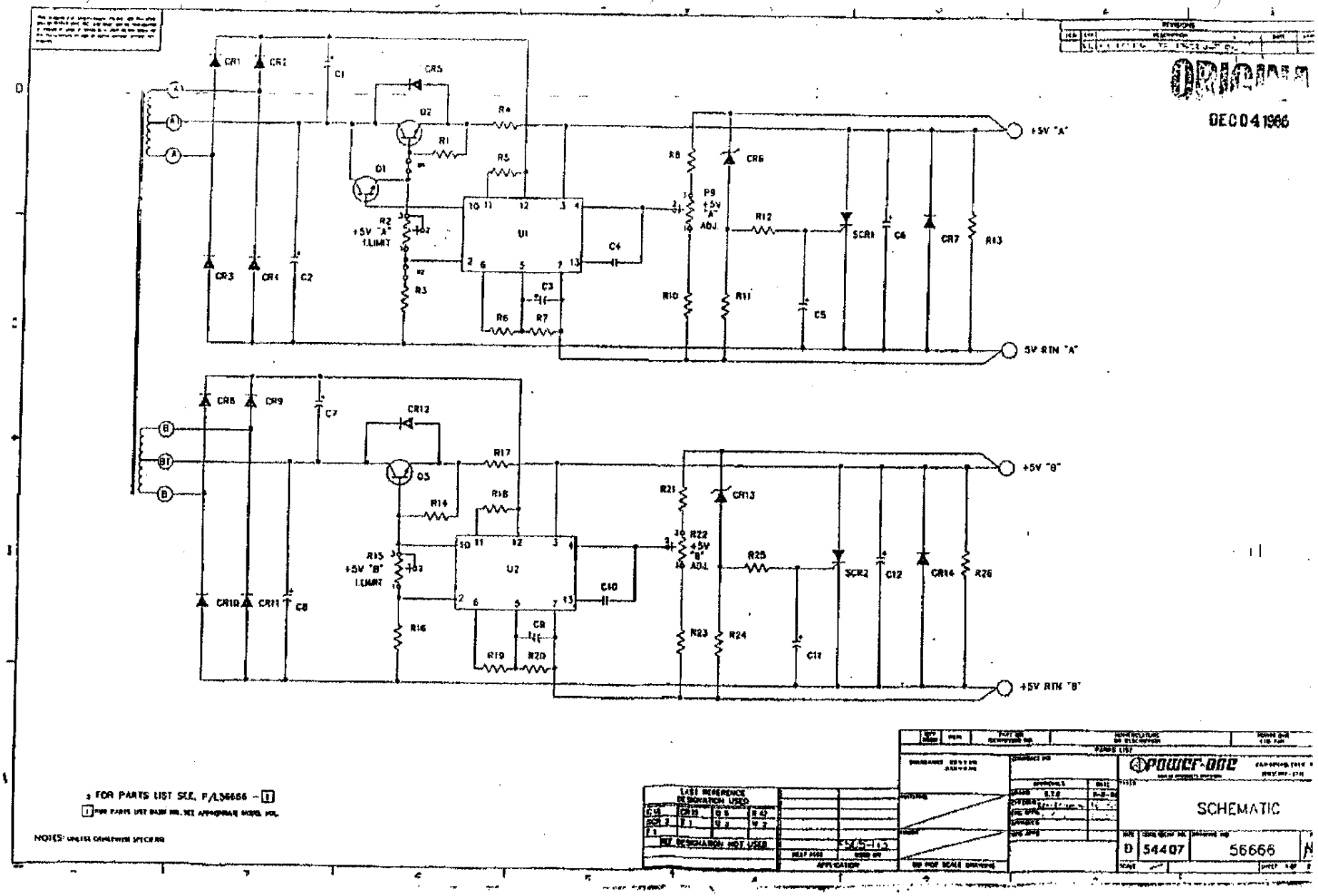
POWER-ONE INC. CAMARILLO, CALIF. 93010 (805)484-2806

TITLE

PWB HARDWARE

SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	54407	56665	N/A

SCALE 1:1 SHEET 1 OF 1



DEC 04 1966

2 FOR PARTS LIST SEE, P/L 56666 - 1

1 FOR PARTS LIST DASH NO. SEE APPROPRIATE MODEL NO.

NOTES: UNLESS OTHERWISE SPECIFIED

LAST REFERENCE DESIGNATION USED

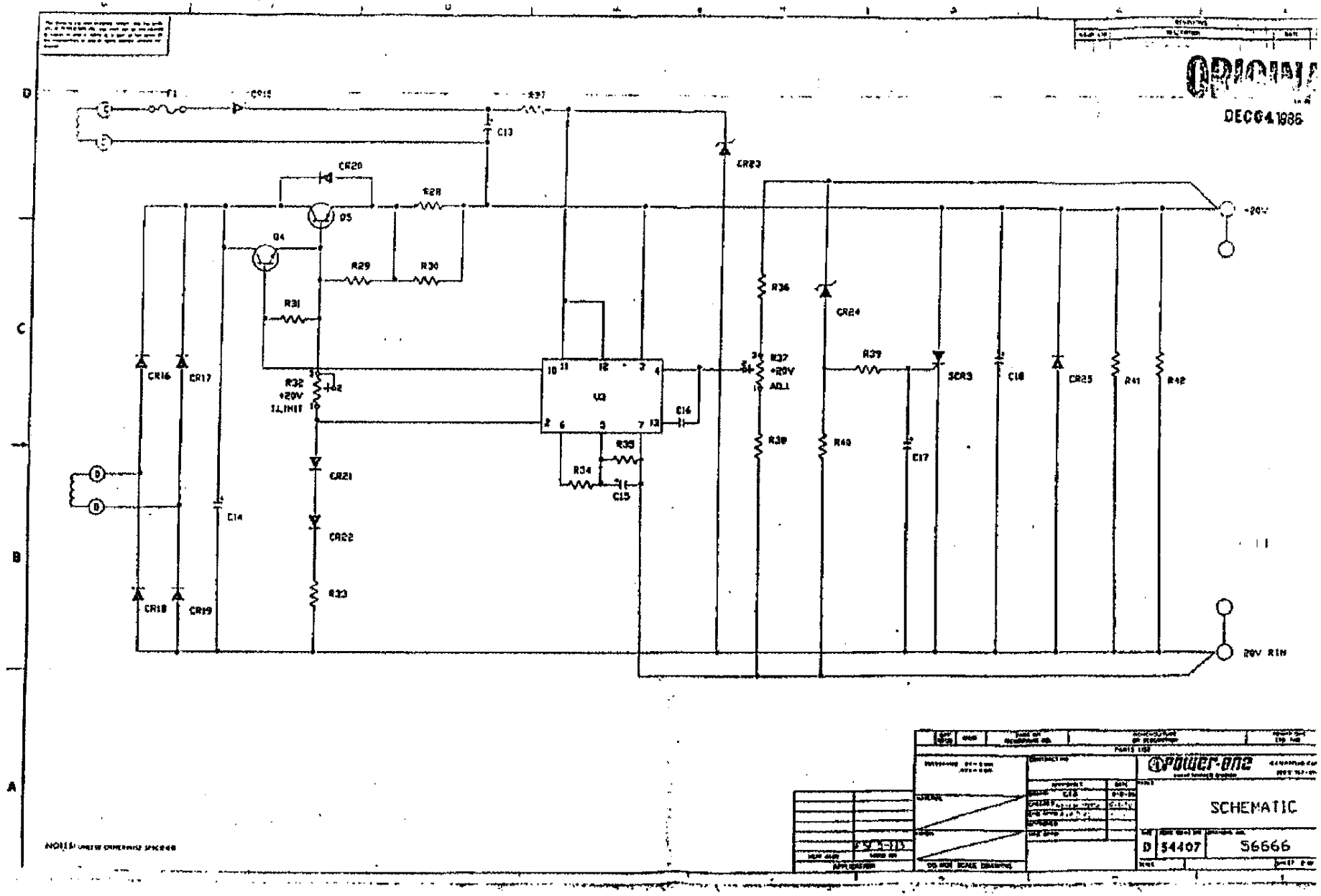
C16	CR13	Q3	R40
SCR 2	J1	U2	W2
J1			

NEXT DESIGNATION NOT USED

POWER-ONE

SCHEMATIC

SIZE	DRAWING NO.	REVISION
D	54407	56666


ORIGINAL
DEC 04 1986
T1
C13
CR20
Q5
Q4
R28
R29
R30
R31
R32
+20V
I LIMIT
R34
R35
C15
C16
U2
CR16
CR17
CR18
CR19
C14
CR21
CR22
R33
CR23
R36
CR24
R37
+20V
ADJ.
R38
R39
R40
C17
SCR3
C18
CR25
R41
R42
+20V
20V RTN
SCHEMATIC
Power-one
D
54407
56666

PARTS LIST

power-one d.c. power supplies

DWG NO. PL.56666-101 | SHEET 1 OF 4 | REV. A

TITLE: P.W.B. ASSEMBLY

USED ON: FS05-113

APPROVALS		DATE			DATE
DRAWN:	[illegible]	8-11-86	ENG. APPD.	[illegible]	12-3-86
CHECKED:	Ron Fedderus	12-3-86	APPROVED:		

NOTE:

1. FOR SCHEMATIC, SEE DWG.# 56666.

ORIGINAL

MAR 12 1987

REVISIONS

ECO	LET	DESCRIPTION	DATE	APPD	ECO	LET	DESCRIPTION	DATE	APPD
—	N/R	RELEASED TO PRODUCTION	12-3-86	[illegible]					
3906	A	INC. ECO.	3-12-87	[illegible]					

99388

PARTS LIST

Power-one D.C. Power Supplies

DWG. NO. PL. 56666-101 | SHEET 2 OF 4 | REV. SEE SHT. 1

ITEM NO.	NOTE	QTY REQD	POWER ONE STD PART NO.	DESCRIPTION.	VENDOR NO.	REF. DES.
1		1	505-56665	PRINTED WIRING BOARD	BD*56664	A1
2						
3		3	154-20020	POTENTIOMETER, 2K		R9, 22, 37
4		3	154-20937	POTENTIOMETER, 500Ω		R2, 15, 32
5						
6		1	158-10077	RESISTOR, .12Ω, 2W, 5%, M.O.		R4
7		3	158-10081	.39Ω, 2W, M.O.		R17, 28, 30
8		3	150-20307	6.8Ω, 1/4W, C.F.		R12, 25, 39
9		4	-20327	47Ω		R5, 11, 18, 24
10		3	-20343	220Ω		R13, 26, 34
11		2	-20356	750Ω		R8, 21
12		4	-20364	1.6K		R1, 3, 14, 16
13		4	-20368	2.4K		R29, 31, 38, 40
14		6	-20372	3.6K		R6, 7, 10, 19, 20, 23
15		4	150-20375	RESISTOR 4.7K, 1/4W, 5%, C.F.		R33, 36, 41, 42
16						
17		0	—	RESISTOR —		R35
18		1	151-10370	RESISTOR, 1.6K, 1/2W, 5%, C.F.		R27

10355

PARTS LIST

Power-One D.C. Power Supplies

DWG. NO. PL.56666-101 | SHEET 3 OF 4 | REV. SEE SHT. 1

ITEM NO.	NOTE	QTY REQD	POWER ONE STD PART NO.	DESCRIPTION.	VENDOR NO.	REF. DES.
19		3	130-10287	I.C. VOLTAGE REGULATOR	μA723	U1,2,3
20						
21		REF.	171-10262	TRANSISTOR, NPN, TO-3	2N3055	Q2,3,5
22		1	172-10247	TRANSISTOR, NPN, TO-92	2N2219	Q1
23		1	172-20771	TRANSISTOR, NPN, TO-220	TIP29A	Q4
24						
25		3	160-10258	SCR, 3A, 30V	S0303LS3	SCR 1,2,3
26						
27		1	120-20954	FUSE, PICO, 1A, 125V		F1
28						
29		11	111-10251	DIODE, 1A, 200V	1N4003	CR1,2,5,7,8,9,12, 14,15,20,25
30		2	〃-10252	〃 3A, 100V	1N5401	CR10,11
31		6	〃-10256	〃 6A, 50V	MR750	CR3,4,16,17,18,19
32		2	111-20058	〃 0.2A, 100V	1N4448	CR21,22
33		2	112-10006	〃 ZENER, 5.6V	1N752A	CR6,13
34		1	112-10285	DIODE ZENER, 2	1N970B	CR24
35		0	—	DIODE ZENER	—	CR23
36						

ORIGINAL

MAR 12 1987

99358

PARTS LIST

Power-One D.C. Power Supplies

DWG. NO. PL.56666-101

SHEET 4 OF 4

REV. SEE SHT. 1

ITEM NO.	NOTE	QTY REQD	POWER ONE STD PART NO.	DESCRIPTION.	VENDOR NO.	REF. DES.
37		6	101-10114	CAPACITOR, ELECT., 10uf/25V		C3,5,9,11,15,17
38		1	-20932	4700uf/16V		C8
39		1	-20933	10,000uf/16V		C2
40		1	-21731	7400uf/63V		C14
41		6	101-21987	ELECT, 220uf/35V		C1,6,7,12,13,18
42		2	104-10093	FILM, .001uf/100V		C4,10
43		1	105-10089	CAPACITOR, CERAMIC, 470pf/1K		C16
44						
45		3	321-10679	I.C. SOCKET, 14 PIN		FOR: U1,2,3
46		4	352-10218	SCREW 6-32 X 5/16"		FOR Q4, SCR 1,2,3
47						
48		1	261-20002	JUMPER, .250", 22 AWG, TEFL		W1
49		1	261-20555	JUMPER, 1.00", 22 AWG, TEFL		W2
50		1	916-55490	WIRE UL1429 16GA, WHITE, 3½"	MAR 12	D(1)
51		1	916-21033	WIRE UL1429 16GA, WHITE, 5½"		D(2)
52		3	916-54958	WIRE UL1429 16GA, WHITE, 3½"		A, AT, A
53		3	914-21284	WIRE UL1429 20GA, WHITE, 3½"		B, BT, B
54		2	914-21065	WIRE UL1429 20GA, BLACK, 5½"		C, C

MODEL NO. FS05-113 WORK ORDER NO. _____

SALES ORDER NO. _____ QTY. _____

DATE IN _____ DUE DATE _____

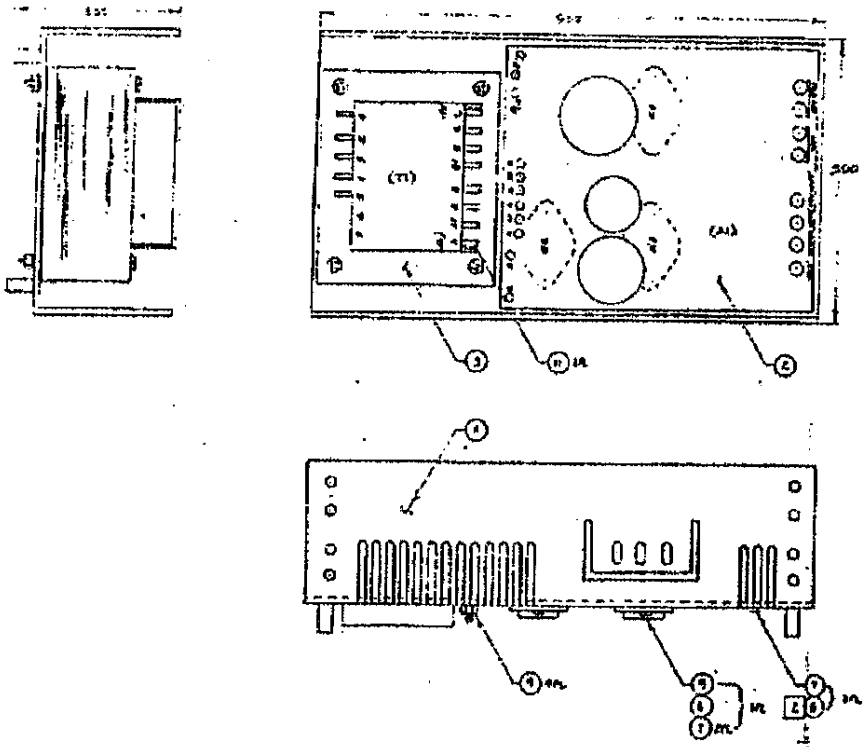
DWG.#	SIZE	DESCRIPTION	ECO	REV.	DATE
56660	D	ASSEMBLY, POWER SUPPLY		NR	
56660-101	A	ASSEMBLY, POWER SUPPLY P/L		NR	
56661	A	DATA SHEET		NR	
53670	D	CHASSIS		C	
55938	D	CHASSIS HARDWARE		NR	
A56662	A	CHASSIS SILKSCREEN		NR	
50633	B	TRANSFORMER PRIMARY		B	
56663	B	TRANSFORMER SECONDARY		NR	
A56664	C	P.W.B. ARTWORK		NR	
56664	C	P.W.B. DRILL		NR	
56665	C	P.W.B. HARDWARE		NR	
56666	D	SCHEMATIC		NR	
56666-101	A	P.W.B. ASSEMBLY P/L		A	

POWER-ONE

DEC 04 1986

MASTER DWG. LIST

REV. N/R SHEET 1 OF 1



FOR PARTS LIST, SEE P/L 56660-[1]

Power-One	
ASSEMBLY, POWER SUPPLY	
D 54407	56660

PARTS LIST

Power-one LINEAR PRODUCTS DIVISION

DWG NO. PL. 56660-101 | SHEET 1 OF 2 | REV. N/R

TITLE: ASSEMBLY, POWER SUPPLY

USED ON: FS05-1.13

APPROVALS		DATE			DATE
DRAWN: Roy Rodrigues		11-18-86	ENG. APPD.		12-3-86
CHECKED:		12-3-86	APPROVED:		

NOTE: 1. FOR ASSEMBLY, SEE DWG. #56660.

WIRING TABLE	
FROM	TO
A1-A	T1-A
A1-AT	T1-AT
A1-B	T1-B
A1-BT	T1-BT
A1-C	T1-C
A1-D(1)	T1-D1
A1-D(2)	T1-D2

ORIGINAL

DEC 04 1986

REVISIONS

ECO	LET	DESCRIPTION	DATE	APPD	ECO	LET	DESCRIPTION	DATE	APPD
—	N/R	RELEASED TO PRODUCTION	12-3-86						

P0336

PARTS LIST

Power-one D.C. POWER SUPPLIES

DWG. NO. PL. 56660-101 | SHEET 2 OF 2 | REV. SEE SHT. 1

ITEM NO.	NOTE	QTY REQD	POWER ONE STD PART NO.	DESCRIPTION.	VENDOR NO.	REF. DES.
1		1	412 - 56662	CHASSIS W/SILKSCREEN	53670/55938	
2		1	081 -56666-101	P.W.B. ASSEMBLY	BD#56664	A1
3		1	082 -56663	TRANSFORMER		T1
4		3	171 -10262	TRANSISTOR, NPN, TO-3	2N3055	Q2,3,5
5		3	320 -10288	INSULATOR; MICA, TO-3		
6		3	320 -10290	INSULATOR; McNABB, TO-3		
7		9	350 -10206	SCREW, B.H., 6-32 X 7/16"		
8		3	391 -20185	SHOULDER WASHER		
9		4	340 -10603	NUT, KEP, # 6		
10						
11		.125FT	360 - 22203	SLEEVING, 3/8" DIA., CUT 3/4" LONG, 2PL		FOR: D1, D2
12						
13						
14						
15						
16						
17						
18						