

**OPERATION AND MAINTENANCE MANUAL
FOR
DN-14-12 FREQUENCY TRANSLATOR**

MAY 2004

CUSTOMER

MAXXXXXT
119668B
Rev.B

NOTE

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 DN-14-12 Frequency Translator has been supplied with the following options:

- A. AC Voltage Input: XXX VAC

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SECTION 1
INTRODUCTION

1.1 GENERAL DESCRIPTION

1.1.1 PHYSICAL

The following is a general description of the DN-14-12 Frequency Translator. The main chassis houses all RF components, control circuitry and power supplies.

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

- On/Off Power Switch (A1A2)
- LO Mechanical Tune Adjustment
- Level Control
- LO Out-of-Lock LED
- Internal/External Reference Select Switch (Option 3, 6B)
- External Reference Input Connector, J3 (Option 3, 6)
- Internal/External Local Oscillator Select Switch (Option 4)
- External Local Oscillator Input Connector (Option 4)
- LO Frequency/Power Monitor
- LO Phase Voltage Test Point
- DC Power Supply Test Point
- Input Connector, J1
- Output Connector, J2

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

- Input Connector, J1 (Option 10 only)
- Output Connector, J2 (Option 10 only)
- Summary Alarm Connector, J4 (Option 7 only)
- AC Voltage Input, Fuse
- E. Ground Lug

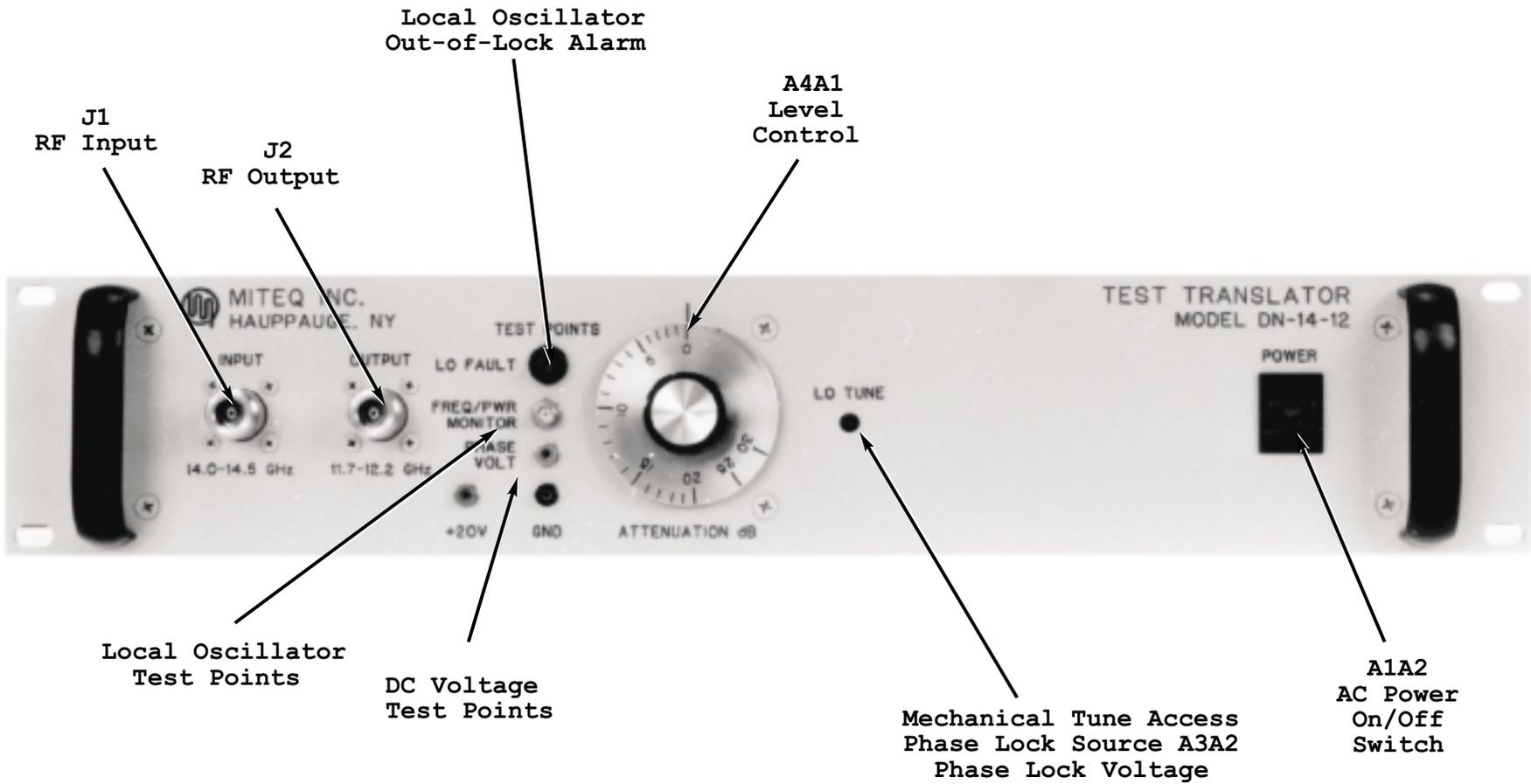


Figure 1-1. Front View, DN-14-12 Translator

A1A1
AC Voltage
Input/Fuse



Ground
Lug

Figure 1-2. Rear View, DN-14-12 Translator

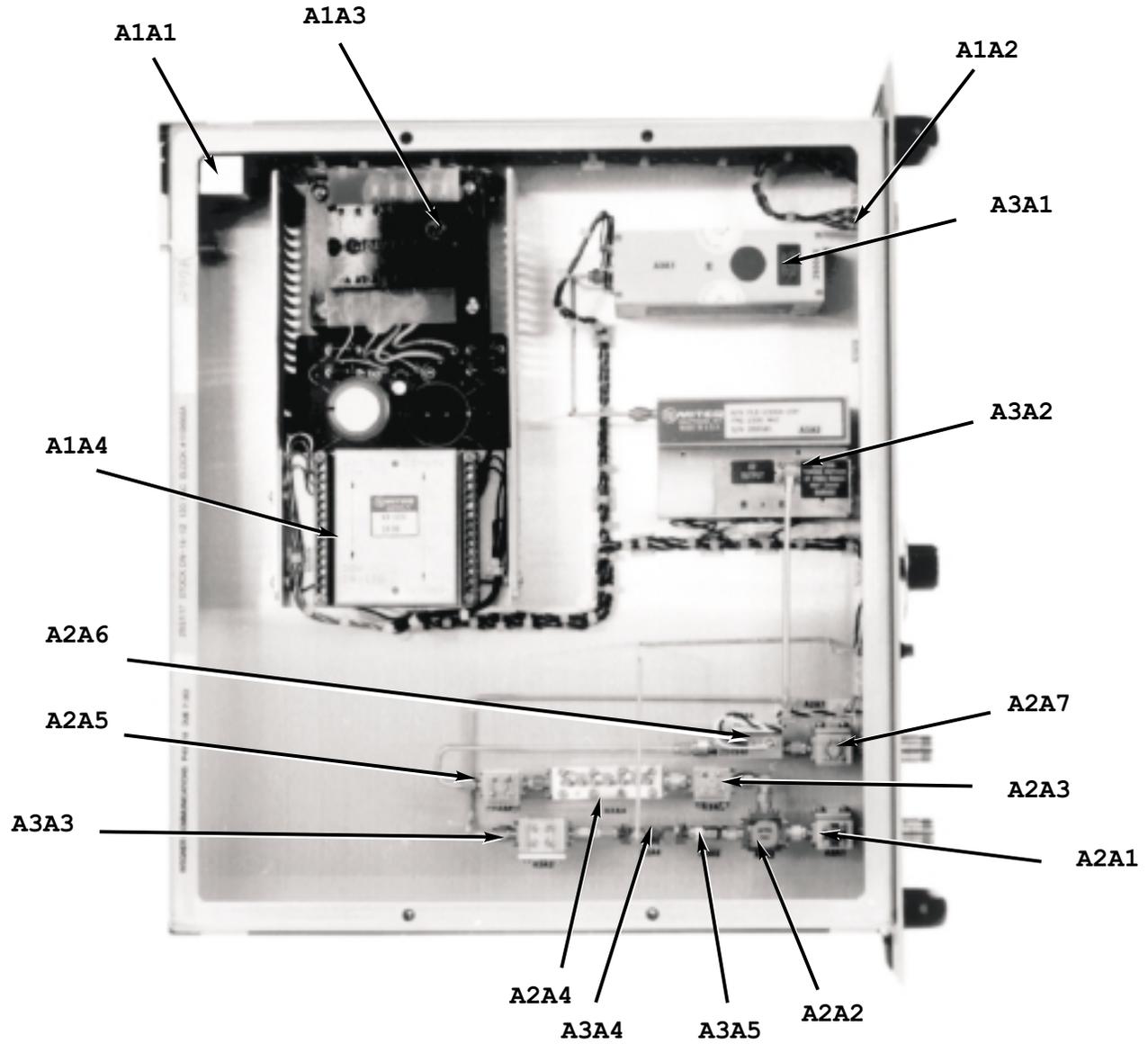


Figure 1-3. Interior View, DN-14-12 Translator

1.1.2 FUNCTIONAL

The MITEQ Frequency Translator uses a single-conversion technique with crystal oscillator reference for the local oscillator.

The Translator translates the input frequency band to the output frequency band using a local oscillator that is phase locked to a high stability internal reference source or an external reference source.

Relays are provided for summary alarm output (Option 7 only) which may be used for monitoring at a remote console.

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

1.2 EQUIPMENT CHARACTERISTICS

1.2.1 PHYSICAL

A. Weight:	20 pounds
B. Overall Dimensions:	19" x 15" x 3.5" panel height
C. Input Connector, J1:	N female
D. Output Connector, J2:	N female
E. Summary Alarm Connector, J4 (Option 7 only):	DE-9P
F. External Reference Input Connector, J3 (Option 3, 6 only):	BNC female
G. External Local Oscillator Input Connector:	SMA female

1.2.2 FUNCTIONAL

A. Conversion Loss, Frequency Response -	
1. Input Frequency:	14.0-14.5 GHz
2. Output Frequency:	11.7-12.2 GHz
3. Conversion Loss:	12 dB maximum 15 dB with Options 1 and/or 2
4. Amplitude Response:	± 0.25 dB/40 MHz ± 1 dB/Output Band
B. VSWR:	23 dB return loss/50 ohms
C. Frequency Stability (0° to 50°C):	1 ppm/day 0.1 ppm/day (Option 5)

- D. Level Control: 30 dB
60 dB (Option 1)
- E. Intermodulation Distortion: With two inband input signals each at
-13 dBm, third order intermodulation
products less than -50 dBc
- F. Input/Output Isolation: 60 dB minimum
- G. Primary Power: 100/120/220/240VAC
selectable at rear panel
- H. Summary Alarm (Option 7) Connector (J4) 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 Oscillators Out-of-Lock
- I. Monitor/Test Points -
1. LO Out-of-Lock LED
 2. LO Phase Voltage: 4.5 ±0.5V
 3. LOA Phase Voltage (Option 6): 12 ±2.0V
 4. LOB Phase Voltage (Option 6): 4.5 ±0.5V
 5. Frequency/Power Test Point: 2.3 GHz
 6. +20V Test Point: +20 ±0.5V
 7. +5V Test Point (Option 6): +5 ±0.2V
- J. External Reference Input -
1. Option 3: 104.545455 MHz, 0 ±3 dBm
 2. Option 6: 5.0 MHz, 0 ±3 dBm
- K. External Local Oscillator Input (Option 4): 2.3 GHz, +13 dBm

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 DN-14-12 Translator	1
2	AC Voltage Line Cord	1
3	DE-9S Connector (Option 7)	1

1.3.2 EQUIPMENT REQUIRED BUT NOT SUPPLIED

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

TABLE 1-2
TEST EQUIPMENT REQUIRED BUT NOT SUPPLIED

ITEM	DESCRIPTION	QUANTITY
1	Wiltron 6747 Sweep Generator	1
2	Wiltron 562 Scalar 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	Anritsu ME538L Microwave System Analyzer	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	Fluke 6160B Reference Synthesizer	1
15	Digital Multi-Meter	1

SECTION 2

INSTALLATION

2.1 UNPACKING, STORAGE, RESHIPMENT

Carefully open the shipping container and remove the equipment. Weight of the unit is approximately 20 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 unit. The carton should be marked to indicate that it contains fragile electronic equipment.

2.2 MOUNTING

The chassis is 19" x 15" x 3.5" panel height and has been designed for mounting in a standard 19" equipment rack. The unit 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 unit.

Apply power to the unit via the front panel power On/Off switch.

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

LO fault light should be off.

System is now operational.

TABLE 2-1
EXTERNAL CONNECTIONS

DESIGNATION	DESCRIPTION
Power Cord	Attach power cord to AC socket of unit. Connect other end to a power line.
Input	Connect input to J1.
Output	Connect output to J2.
Summary Alarm (Option 7 Only)	Connect Summary Alarm to J4.
External Reference (Options 3, 6B only)	If the internal crystal reference is used, place the INT/EXT Reference Switch in the "INT" position. If the internal crystal reference is not used, place the INT/EXT Reference Switch in the "EXT" position and connect a reference source to the external reference connector of the translator.
External LO (Option 4 only)	If the internal local oscillator is used, place the INT/EXT LO Switch in the "INT" position. If the internal local oscillator is not used, place the INT/EXT LO Switch in the "EXT" position and connect a frequency source to the external LO connector of the translator.
5 MHz Reference Input (Option 6A only)	Connect a 5 MHz reference source to the 5 MHz reference input of the translator.
Ground Lug	Be sure the translator is grounded.

SECTION 3

OPERATION

3.1 INTRODUCTION

The following paragraphs describe the controls, adjustments and procedures for turn-on, operation, emergency operation and shutdown of the Translator.

3.2 CONTROLS

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

- A. On/Off switch (A1A2) applies AC power to the unit
- B. Fuse (A1A1) 2.0A for 100/120VAC, 1.0A for 220,240VAC
(Option 6 - 3.0A for 100/120VAC, 1.5A for 220,240VAC)
- C. Attenuation Control (A4A1)

A control dial calibrated for 0 to 30 dB attenuation control is located on the front panel. With Option 1A the dial is calibrated for 0 to 60 dB attenuation. With Option 1B there are two dials on the front panel. One controls the input attenuator and the other controls the output attenuator. Each dial is calibrated for 0 to 30 dB attenuation.

- D. Option 3, 6B - INT/EXT Reference Select Switch

This switch, located on the front panel, selects either the internal crystal source or an external source connected to the external reference connector.

- E. Option 4 - INT/EXT LO Select Switch

This switch, located on the front panel, selects either the internal local oscillator chain or an external source connected to the external LO connector as the signal used for frequency translation.

- F. LO Mechanical Tuning Phase Voltage (Front Panel)

The phase lock oscillator has been set to the nominal center of the phase lock frequency range. The oscillator will remain in phase lock over a 2 to 8 volt range in phase lock voltage. However, the voltage should be maintained at a nominal 4.5 ± 0.5 volts. Minor adjustments may be made by rotating the oscillator tuning shaft (using a No. 1 Phillips head adjustment tool) while monitoring the "Phase Voltage" at the front panel with a DC coupled oscilloscope or voltmeter. Adjustment should be made at room temperature with proper DC power applied, output load conditions and reference signal input applied to the phase lock source.

Care should be taken not to tune oscillator shaft to a frequency outside of the oscillator locking range. If this should occur, the "Phase Voltage" will be a 2 to 8 volt triangular swept waveform. Using a spectrum analyzer to monitor frequency at the "Freq/Power" test point, the oscillator must be retuned to center frequency where phase lock will occur. If the reference frequency of the source is changed (Option 3), the phase lock oscillator must be tuned to the new frequency using a spectrum analyzer.

3.2.2 INTERNAL CONTROLS (Figure 1-3)

A. Power Supply Voltage Adjustment (A1A3)

Adjustment of the power supply within tolerances may be made using an insulated tuning tool (refer to Appendix).

B. Frequency Adjustment of Crystal Oscillator (A3A1)

The frequency of the local oscillator can be monitored at the front panel "Freq/Power Monitor". Adjustments in frequency can be made by adjusting a tunable capacitor in the reference source A3A1, accessible through the top surface of the source (refer to Figure 1-3). Adjustment should be made at room temperature after one half hour of warm-up time.

C. Option 6 - LO Mechanical Tuning (A3A1) Phase Voltage

The phase lock oscillator has been set to the nominal center of the phase lock frequency range. The oscillator will remain in phase lock over a 4 to 16 volt range in phase lock voltage. However, the voltage should be maintained at a nominal 12 ± 2 volts. Minor adjustments may be made by adjusting a tunable capacitor in the source A3A1, accessible through the top surface of the source (refer to Figure 1-3) while monitoring the "Phase Voltage" at the front panel with a DC coupled oscilloscope or voltmeter. Adjustment should be made at room temperature with proper DC power applied, output load conditions and reference signal input applied to the phase lock source.

3.3 OPERATING PROCEDURE

3.3.1 NORMAL OPERATION

Follow the Turn-On procedure in Section 2.3.

3.3.2 EMERGENCY OPERATION

In the event of a fault in one of the phase lock sources used in the system, a fault LED indicator on the front panel will light. Consult corrective maintenance, Section 5.3, to determine possible cause and/or remedies.

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

3.3.3 SHUTDOWN PROCEDURE

The unit is completely shutdown when the AC power is removed.

SECTION 4

PRINCIPLES OF OPERATION

4.1 INTRODUCTION

The following paragraphs provide information on the principles of operation of the MITEQ Model DN-14-12 Frequency Translator. The 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 translator translates the 14.0-14.5 GHz input frequency band to the output frequency of 11.7-12.2 GHz. A single conversion system is used (see Figure 4-1).

The input signal is fed to an isolator for matching. With Option 2, the isolator is followed by an input filter to reject any out-of-band spurious signals. If Option 1 is installed, the signal passes through a continuously variable 30 dB PIN diode attenuator.

The signal is then fed to a double balanced mixer which is used to convert the input frequency band to the output frequency band. The output of the mixer is filtered to eliminate out-of-band signals. The signal is fed to a PIN attenuator which is controlled by a front panel potentiometer and calibrated dial. An optional amplifier may be installed to increase the output level of the translator (Option 8).

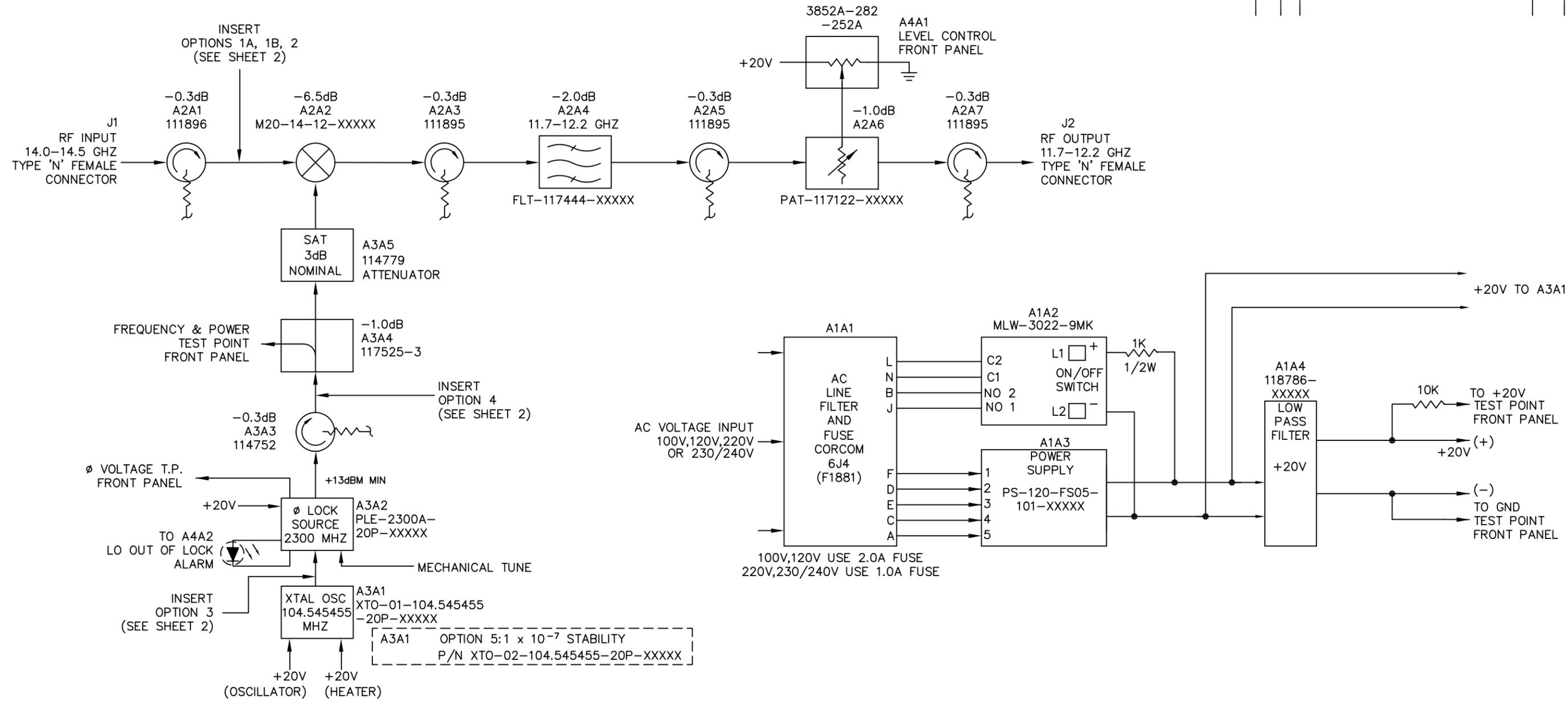
In the local oscillator, an internal crystal oscillator is used as the reference for a phase-locked source. An optional switch allows insertion of an external reference input (Option 3, 6B).

Option 4 uses a coaxial switch at the output of the local oscillator chain to allow insertion of an external local oscillator.

With Option 6, a 5 MHz reference is used for the phase-locked source.

Option 7 provides a rear panel summary alarm for remote detection of faults in the translator.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL
	B	DELETED (REAR PANEL) FROM J1 INPUT & J2 OUTPUT	1/22/98	



NOTES
 1. XXXXX IS A UNIQUE REFERENCE NUMBER ASSIGNED AT TIME OF ORDER.

SYM	DESCRIPTION	QTY	NEXT ASSY	USED ON
	HOLE DATA TABLE			APPLICATION

QTY REQ'D	NOMENCLATURE OR DESCRIPTION	SYM/NOTES	PART NO.	CODE IDENT.	ITEM NO.
	WIRING	112065			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON		DRN BY		NAME		DATE	
DECIMALS	ANGLES	CHKD BY					
.XX±.01	.XXX±.005	APPROVED BY					
MATERIAL		PROJ ENGR					
FINISH		ENG SECT					
HEAT TREAT		Q.A.					

SIZE	CODE IDENT. NO.	REV.
C	33592	B

SCALE 1/1 REF P37321 SHEET 1 OF 2



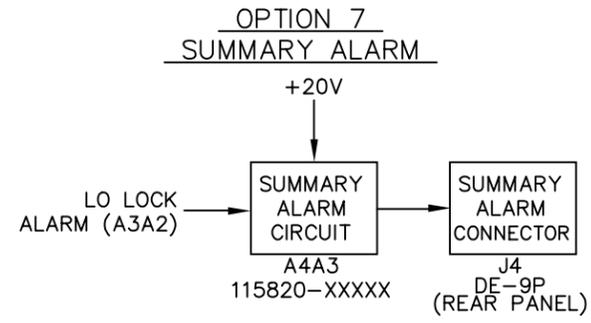
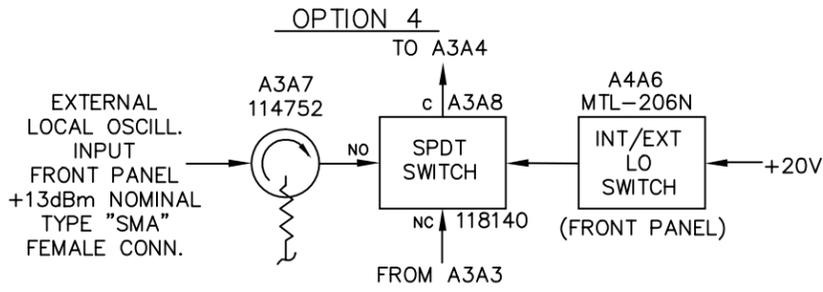
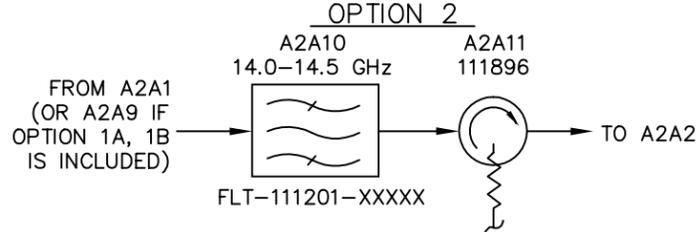
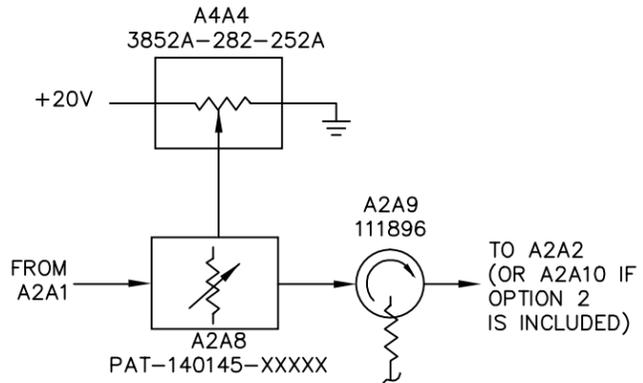
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REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL
	B	SEE SHEET ONE FOR REVISION	1/22/98	

OPTION 1A, 1B

OPTION 1A CONTROL TO A4A1 FRONT PANEL
0-60dB SIMULTANEOUS CONTROL
OF INPUT/OUTPUT ATTENUATORS

OPTION 1B CONTROL TO INDEPENDENT CALIBRATED
LEVEL CONTROL ON FRONT PANEL



J4 SUMMARY ALARM CONNECTOR PIN DESIGNATION IS AS FOLLOWS:

DC POWER STATUS

DC POWER NORMAL: 1-2 OPEN, 2-3 CLOSED

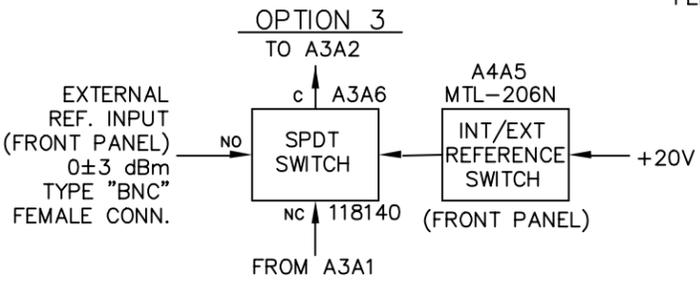
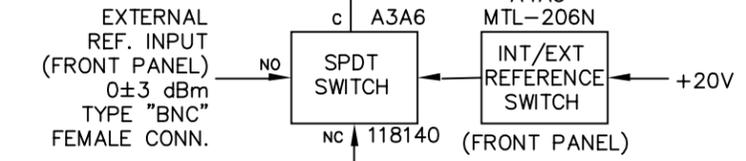
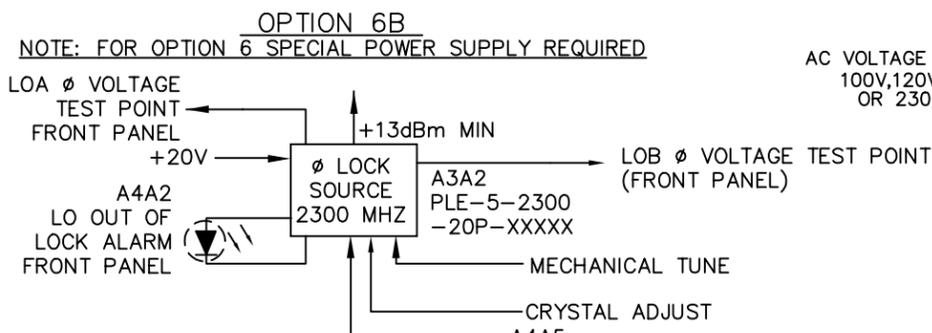
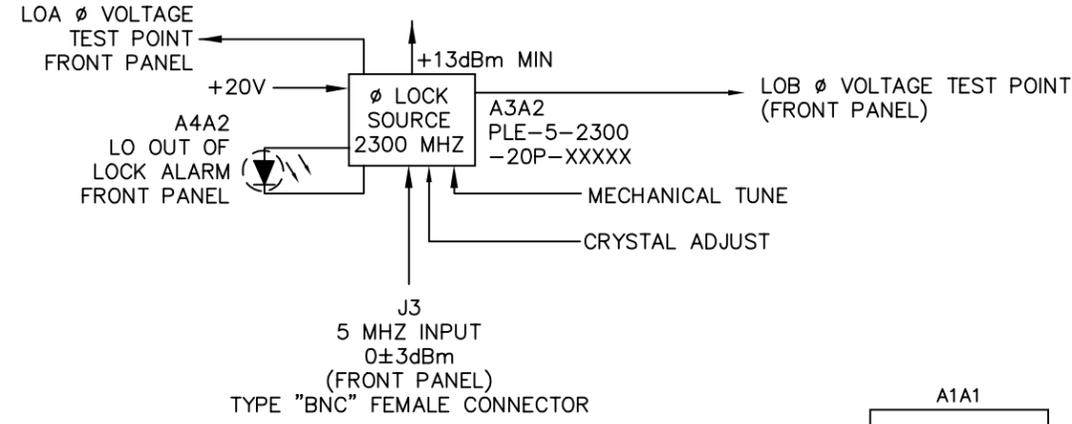
DC POWER FAULT: 1-2 CLOSED, 2-3 OPEN

SUMMARY ALARM

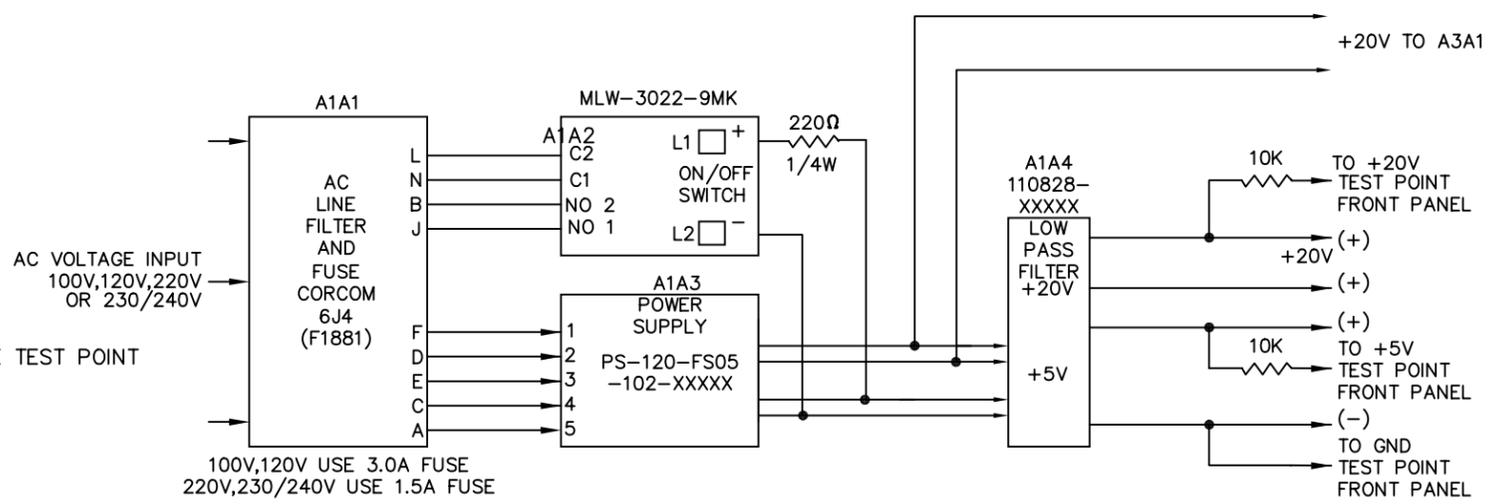
DC POWER NORMAL AND LOCAL OCILLATOR IN-LOCK: 4-5 OPEN, 5-6 CLOSED

DC POWER FAULT OR LOCAL OSCILLATOR OUT-OF-LOCK: 4-5 CLOSED, 5-6 OPEN

OPTION 6A
A3A1 OMITTED, A3A2 REPLACED
NOTE: FOR OPTION 6 SPECIAL POWER SUPPLY REQUIRED



**POWER SUPPLY USED FOR TRANSLATORS
OPTION 6 ONLY**



SYM	DESCRIPTION	QTY	NEXT ASSY	USED ON
	HOLE DATA TABLE			APPLICATION

NOMENCLATURE OR DESCRIPTION					SYM/NOTES	PART NO.	CODE IDENT.	ITEM NO.
-5	-4	-3	-2	-1				
QTY REQ'D					PARTS LIST			
WIRING XXXXX					UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON DECIMALS .XX±.01 .XXX±.005 ANGLES ±0'30"			
PANEL XXXXX					DRN BY NAME DATE			
					CHKD BY B. Schmitz 12/3/91			
MATERIAL					APPROVED BY			
FINISH					PROJ ENGR			
					ENG SECT			
					Q.A.			
SIZE		CODE IDENT. NO.		REV.				
C		33592		119668		B		
SCALE - REF 37112					SHEET 2 OF 2			



**BLOCK DIAGRAM
TRANSLATOR
MODEL DN-14-12**

119668

4.3 SUBSYSTEMS AND COMPONENTS FUNCTIONAL DESCRIPTION

4.3.1 SIGNAL PATH

4.3.1.1 Input Isolator (A2A1)

Description: Isolator
Part Number: 111896

Specifications -

A. Frequency:	13.9-14.6 GHz
B. Insertion Loss:	0.25 dB
C. Input/Output VSWR:	1.15:1
D. Isolation:	23 dB minimum
E. Connectors:	SMA female

4.3.1.1.1 Option 1 - Input Attenuator, Isolator (A2A8, A2A9)

A2A8 -

Description: PIN Attenuator
Part Number: PAT-140145-XXXXX
Function: Level Control
Design: Absorbitive

Specifications -

A. Frequency:	14.0-14.5 GHz
B. Gain Control:	30 dB min.
C. Input/Output VSWR:	1.5:1
D. DC Control Voltage:	0 to 20 V
E. Connectors:	SMA Male

A2A9 -

Description: Isolator
Specifications: see para. 4.3.1.1

4.3.1.1.2 Option 2 - Input Filter, Isolator (A2A10, A2A11)

A2A10 -

Description: Filter

Part Number: FLT-111201-XXXXX

Function: Rejection of out of band signals

Design: Five section waveguide (WR62)

Specifications -

- | | |
|--------------------|----------------------|
| A. Frequency: | 14.0-14.5 GHz |
| B. Insertion Loss: | 0.4 dB |
| C. Flatness: | 0.2 dB peak to peak |
| D. Rejection: | 50 dBc/+1GHz |
| E. Connectors - | |
| 1. Input: | Right angle SMA male |
| 2. Output: | Right angle SMA male |

A2A11 -

Description: Isolator

Specifications: see para. 4.3.1.1

4.3.1.2 Mixer (A2A2)

Part Number: M20-14-12-XXXXX

Function: Frequency translation

Design: Double balanced

Specifications -

A. Input Frequency:	14.0-14.5 GHz
B. Output Frequency:	11.7-12.2 GHz
C. LO Frequency:	2.3 GHz
D. Conversion Loss:	.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 Isolators, Filter, PIN Attenuator (A2A3 to A2A7)

A2A3, A2A5, A2A7 -

Description: Isolator

Part Number: 111895

Specifications -

A. Frequency:	10.7-12.7 GHz
B. Insertion Loss:	0.25 dB
C. VSWR Input/Output:	1.15:1
D. Isolation:	23 dB minimum
E. Connectors:	SMA female

A2A4 -

Description: Filter

Part Number: FLT-117444-XXXXX

Function: Rejection of out of band signals

Design: Five Pole Combine

Specifications -

- | | |
|-----------------------|---------------------|
| A. Frequency: | 11.7-12.2 GHz |
| B. Insertion Loss: | 2.5 dB |
| C. Flatness: | 0.2 dB peak to peak |
| D. Input/Output VSWR: | 1.2:1 |
| E. Connectors - | |
| 1. Input: | SMA male |
| 2. Output: | SMA male |

A2A6 -

Description: PIN Attenuator

Part Number: PAT-117122-XXXXX

Function: Level Control

Design: Absorbitive

Specifications-

- | | |
|------------------------|---------------|
| A. Frequency: | 11.7-12.2 GHz |
| B. Gain Control: | 30 dB min. |
| C. Input/Output VSWR: | 1.5:1 |
| D. DC Control Voltage: | 0 to 20 V |
| E. Connectors: | SMA Male |

4.3.1.3.1 Option 8 - Output Amplifier

See page ii for details if option 8 is supplied.

4.3.2 LOCAL OSCILLATORS

4.3.2.1 Crystal Oscillator (A3A1)

Part Number - XTO-01-104.545455-20P-XXXXX
XTO-02-104.545455-20P-XXXXX (Option 5)

The crystal oscillator is a highly stable precision crystal oscillator enclosed in a proportionally-controlled oven housing. The temperature of the inner housing is maintained at $70^{\circ}\text{C} \pm 0.2^{\circ}\text{C}$ over an ambient temperature range of 0°C to 55°C .

The crystal oscillator uses a 5th overtone crystal in the series resonant mode. The output power of the crystal oscillator is limited to approximately 0.1 mW. An output amplifier increases the signal level to approximately 0 dBm. The output amplifier also acts as a buffer between the output load and the crystal oscillator.

The temperature of the crystal oscillator housing is stabilized by a proportionally-controlled oven circuit. The crystal oscillator chassis is enclosed in an outer housing. The two chassis are separated by a closed cell foam. This construction inhibits air flow and helps to stabilize the oscillator temperature. A power resistor is secured to the inner housing and acts as a heater element. A sensitive thermistor bridge installed inside the oscillator housing monitors temperature changes. Temperature changes inside the crystal oscillator chassis appear as error voltages at the output of the bridge circuit. This error voltage is amplified and used to regulate the power flow to the heater elements. The high gain thermal bridge maintains the crystal oscillator temperature within 0.2°C over the environmental temperature change.

The specifications of the crystal oscillator are:

- | | |
|-----------------------------|---|
| A. Frequency: | 104.545455 MHz |
| B. Power Output: | 0 ± 3 dBm |
| C. DC Power - | |
| 1. Oscillator: | +20V/50 mA |
| 2. Heater: | +20V/300 mA stabilized at 25°C |
| D. Oven Stabilization Time: | 20 minutes (25°C) |
| E. Frequency Stability: | 1×10^{-6} /day (0° to 50°C) |
| 1. Option 5: | 1×10^{-7} /day (0° to 50°C) |
| F. Connectors - | |
| 1. RF: | SMA female |
| 2. DC: | Solder filter |

4.3.2.2 Phase Lock Source, Isolator, Coupler, Attenuator (A3A2 to A3A5)

A3A2 -

Part Number - PLE-2300A-20P-XXXXX

The phase lock source consists of:

1. Low noise fundamental cavity oscillator with electronic fine tuning
2. Harmonic generator
3. Phase detector
4. Phase lock alarm circuit

The input signal is directed through the harmonic generator and into the phase detector. A sample of the cavity oscillator is also fed to the phase detector where it is compared to the reference harmonic which is closest in frequency. Frequency of the cavity oscillator can be mechanically-tuned to the chosen reference harmonic.

When the signals differ only in phase, the phase detector output is a DC voltage proportional to the phase difference between these two signals. Any frequency difference between the two signals results in a difference frequency at the phase detector output. If that happens, a sweep voltage oscillator starts sweeping and, through a voltage-tuned capacitor, varies the frequency of the cavity oscillator. When the cavity oscillator is at the same frequency as the chosen reference harmonic, the sweep oscillator is disabled and the cavity oscillator is phase locked to the reference harmonic.

The specifications for the phase lock source are:

- | | |
|----------------------|--|
| A. Frequency Output: | 2.3 GHz |
| B. Frequency Input: | 104.545455 MHz |
| C. Power Output: | +13 dBm minimum |
| D. Power Input: | 0±3 dBm |
| E. DC Power: | +20V at 450 mA |
| F. Phase Voltage TP: | 4.5 ±0.5 V "in-lock",
2-8 volts triangular wave "out-of-lock" |
| G. Connectors - | |
| 1. RF: | SMA female |
| 2. DC: | Solder filter |

A3A3 -

Description: Isolator
Part Number: 114752

Specifications -

- | | |
|-----------------------|---------------|
| A. Frequency: | 2140-2360 MHz |
| B. Insertion Loss: | 0.25 dB |
| C. VSWR Input/Output: | 1.15:1 |
| D. Isolation: | 23 dB minimum |
| E. Connectors: | SMA female |

A3A4 -

Description: Coupler
Part Number: 117525-3

Specifications -

- | | |
|-----------------------|------------|
| A. Frequency: | 2-4 GHz |
| B. Insertion Loss: | 0.5 dB |
| C. Input/Output VSWR: | 1.2:1 |
| D. Coupled Output: | 20 dBc |
| E. Connectors - | |
| 1. Input: | SMA female |
| 2. Output: | SMA female |
| 3. Coupled Output: | SMA female |

A3A5 -

Description: Fixed Attenuator
Part Number: 114779-3
Function: Level Adjustment

Specifications-

- | | |
|--------------------|-------------------------|
| A. Insertion Loss: | 3 dB |
| B. Connectors: | SMA Male and SMA Female |

4.3.2.3 Local Oscillator Options

4.3.2.3.1 Option 3, 6B - Internal/External Reference Selection

The internal/external reference select switch consists of an RF switch controlled by a front panel toggle switch. The RF switch breaks the connection between the crystal oscillator and the phase lock source to allow insertion of an external reference from a front panel connector.

External reference input power is 0 ± 3 dBm.

4.3.2.3.2 Option 4 - Internal/External Local Oscillator Selection

The optional internal/external LO select switch consists of an RF switch controlled by a front panel toggle switch. The RF switch breaks the connection between the internal local oscillator chain and the mixer to allow insertion of an external LO from a front panel connector.

External LO input power is +13 dBm nominal.

4.3.2.3.3 Option 6 - 5 MHz Reference

Option 6A replaces the standard crystal oscillator and phase-locked source with a phase-locked source which is phase-locked to a 5 MHz external reference.

Option 6B replaces the standard crystal oscillator and phase-locked source with a 5 MHz crystal oscillator and phase-locked source which is phase-locked to a 5 MHz reference. Internal external reference selection is done as per option 3, see para. 4.3.2.3.1.

A3A1 (Option 6B only) -

Part Number: 115253-XXXXX

The 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. Frequency Stability: | $\pm 2 \times 10^{-8}$ /day (0° to 50°C) |
| F. Connectors - | |
| 1. RF: | SMA female |
| 2. DC: | Solder filter |

Refer to the index for data sheets for the 5 MHz reference source when installed.

A3A2 -

Part Number: PLE-5-2300-20P-XXXXX

The phase lock source consists of:

1. Crystal oscillator with electronic tuning
2. Digital divider
3. Digital reference divider
4. Two Phase detectors
5. Phase lock alarm circuit
6. Low noise fundamental cavity oscillator with electronic tuning
7. Harmonic generator

A crystal oscillator output is sampled and directed to the digital divider and then to the phase detector. The input reference frequency is fed to the reference divider and then to the phase detector. When the signals 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 frequency control capacitor in the crystal oscillator. When the divided output frequency is the same as the divided reference frequency, the sweep is disabled and the oscillator is phase locked to the input reference.

The signal is then directed through the harmonic generator and into the second phase detector. A sample of the VCO is also fed to the phase detector where it is compared to the reference harmonic which is closest in frequency. When the signals differ only in phase, the phase detector output is a DC voltage proportional to the phase difference between these two signals. Any frequency difference between the two signals results in a difference frequency at the phase detector output. If that happens, a sweep voltage oscillator starts sweeping and, through a voltage-tuned capacitor, varies the frequency of the VCO. When the VCO is at the same frequency as the chosen reference harmonic, the sweep oscillator is disabled and the VCO is phase locked to the reference harmonic.

The specifications for the phase lock source are:

- | | |
|-----------------------|--|
| A. Frequency Output: | 2.3 GHz |
| B. Frequency Input: | 5 MHz |
| C. Power Output: | +13 dBm minimum |
| D. Power Input: | 0+3 dBm |
| E. DC Power: | +20V at 500 mA
+5V at 500 mA |
| F. Phase Voltage LOA: | 12 + 2.0 V "in-lock"
1V or 18 volts "out-of-lock" |
| G. Phase Voltage LOA: | 4.5 + 0.5 V "in-lock"
2-8 volts triangular wave "out-of-lock" |
| H. Connectors - | |
| 1. RF: | SMA female |
| 2. DC: | Solder filter |

4.3.3 SUMMARY ALARM CIRCUIT

The schematic diagram for the summary alarm circuit is shown in Diagram 6-2 and the Assembly Diagram in Figure 6-3. The interfacing with the system components and connectors is shown in Wiring Diagram 6-1.

Phase lock source status and DC voltage status are monitored by the summary alarm circuit.

The alarm states for the phase lock sources are:

1. In-Lock: Low 0-2V
2. Out-of-Lock: 2-8V sweep or 18-20V High

4.3.4 POWER SUPPLY, LOW PASS FILTER

A complete manual for the power supply is given in Appendix A. The following information applies:

Voltage	MITEQ Model Number	Power One Part Number	Voltage Setting Tolerance
+20V	PS120-FS05-101-XXXXX	FS05-101	±0.25V
(Option 6)			
+20V	PS120-FS05-102-XXXXX	FS05-102	±0.25V
+5V	PS120-FS05-102-XXXXX	FS05-102	±0.2V

A low pass filter (A1A4) follows the power supply to aid in the rejection of power supply noise.

SECTION 5

MAINTENANCE

5.1 INTRODUCTION

This section includes information and instruction for performance monitoring, adjustment and troubleshooting of the translator.

5.2 PREVENTIVE MAINTENANCE

The translator 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 translator, periodic monitoring of the overall performance parameters that are most indicative of individual component performance is necessary.

A log should be maintained that provides a permanent record of operation and compares it to factory provided data. By doing so, any long term degradation, erratic or abnormal performance can be detected early. The parameters that are most indicative of correct overall performance, and encompass all individual system components, are conversion loss and local oscillator frequency.

Any excessive change in conversion loss 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 test point on the front panel. If voltage is beyond tolerances, reset power supply (refer to Appendix and Figure 1-3) using the tuning adjustment on the power supply.

5.2.2 CONVERSION LOSS OF THE TRANSLATOR

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

Record the conversion loss and frequency response of the translator.

The conversion loss of the translator should be periodically monitored to reveal deviations which would indicate possible malfunction.

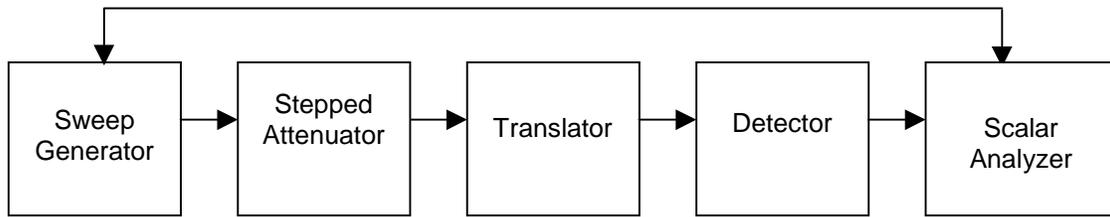


Figure 5-1. Test Setup for Conversion Loss and Frequency Response Measurement

5.2.3 FREQUENCY MEASUREMENT

The frequency of the local oscillators can be monitored at the "Freq/Power Monitor" point.

The frequency varies with the reference used, the phase lock source acting as multiplier of input reference frequency.

Minor adjustments in frequency can be made by adjusting a tunable capacitor in the crystal reference source accessible through the top surface of the source (refer to Figure 1-3). Adjustment should be made at room temperature after one half hour minimum warm-up time.

5.2.4 LOCAL OSCILLATOR PHASE LOCK TEST POINT (Phase Voltage)

The phase lock test point voltage of all phase lock sources 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:

<u>Oscillator</u>	<u>Nominal Test Point Voltage</u>	<u>Test Point Voltage Range</u>	<u>Nominal Out-of-Lock Voltage</u>
LO	4.5V	±0.5V	2-8V sweep
LOA (Option 6)	12V	±2.0V	18V "High"
LOB (Option 6)	4.5V	±0.5V	2-8V sweep

5.3 CORRECTIVE MAINTENANCE

If the Translator malfunctions during normal use or if the tests in Section 5.2 reveal excessive discrepancies in Translator gain or local oscillator frequencies, isolation and correction of the malfunction becomes necessary. Frequency deviation indicates loss of phase lock in the phase-locked oscillator.

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 located in the Appendix, 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.

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 problem, it is recommended that unit be returned for factory repair.

5.3.3 TRANSLATOR, 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 - DN-14-12 TRANSLATOR

ITEM	"A" NUMBER	MANUFACTURER	PART NUMBER	DESCRIPTION
1	A1A1	Corcom	6J4(F1881)	AC Line Filter
2	A1A2	Micro-switch	MLW-3022-9MK	On/Off Switch
3	A1A3	MITEQ	PS-120-FS05-101-XXXXX	Power Supply
			OPTION 6	
		MITEQ	PS-120-FS05-102-XXXXX	Power Supply
4	A1A4	MITEQ	118786-XXXXX	Low Pass Filter
			OPTION 6	
		MITEQ	110828-XXXXX	Low Pass Filter
5	A2A1	MITEQ	11896	Isolator
6	A2A2	MITEQ	M20-14-12-XXXXX	Balanced Mixer
7	A2A3	MITEQ	111895	Isolator
8	A2A4	MITEQ	FLT-117444-XXXXX	Bandpass Filter
9	A2A5	MITEQ	111895	Isolator
10	A2A6	MITEQ	PAT-117122-XXXXX	PIN Attenuator
11	A2A7	MITEQ	111895	Isolator
			OPTIONS 1A, 1B	
12	A2A8	MITEQ	PAT-140145-XXXXX	PIN Attenuator
13	A2A9	MITEQ	111896	Isolator
			OPTION 2	
14	A2A10	MITEQ	FLT-111201-XXXXX	Bandpass Filter
15	A2A11	MITEQ	111896	Isolator
16	A3A1	MITEQ	XTO-01-104.545455-20P-XXXXX	Crystal Oscillator
			OPTION 5	
		MITEQ	XTO-02-104.545455-20P-XXXXX	Crystal Oscillator
			OPTION 6B	
		MITEQ	115253-XXXXX	Crystal Oscillator
17	A3A2	MITEQ	PLE-2300A-20P-XXXXX	Phase Lock Source
			OPTIONS 6A, 6B	
		MITEQ	PLE-5-2300-20P-XXXXX	Phase Lock Source
18	A3A3	MITEQ	114752	Isolator
19	A3A4	MITEQ	117525-3	Directional Coupler
20	A3A5	MITEQ	114779-	SAT Attenuator

SECTION 6

DIAGRAMS

6.1 INTRODUCTION

This section contains the schematics and overall wiring diagram for the DN-14-12 Frequency Translator.

TABLE 6-1
LIST OF DIAGRAMS

Fig. No.	DESCRIPTION	PAGE
6-1	Wiring Diagram	6-2
6-2	Schematic Diagram, Summary Alarm Circuit (Option 7 only) (A4A3)	6-8
6-3	Assembly Diagram, Summary Alarm Circuit (Option 7 only) (A4A3)	6-9

WIRE RUN SHEET

MODEL:DN-14-12

BLOCK DIAGRAM:119668 A

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
NO 1	89	A1A1-J
NO 2	80	A1A1-B
C1	89	A1A1-N
C2	80	A1A1-L
L2	0	A1A4 - GND SECT
L1	2	A1A4 - +20V SECT

122357A

FROM; POWER SUPPLY A1A3		
DESIGNATION	COLOR	TO
A1A3 - 1	80	A1A1 - F
A1A3 - 2	89	A1A1 - D
A1A3 - 3	80	A1A1 - E
A1A3 - 4	89	A1A1 - C
A1A3 - 5	80	A1A1 - A
+20V	29 X 2	A1A4 +20V INPUT
+20V RTN	0 X 2	A1A4 +20V RTN INPUT
+20V	20	A3A1 - XTO
+20V RTN	0	A3A1 - XTO RTN

FROM; LOW PASS FILTER AND TERMINAL STRIP A1A4		
DESIGNATION	COLOR	TO
+20V T.P.	92	+20V T.P. FRT PANEL
+20V T.P. RTN	0	+20V T.P. RTN FRT PANEL
+20V	2	A1A2-L1
+20V RTN	0	A1A2-L2
+20V	29	A3A1 - XTO
+20V RTN	0	A3A1 - XTO RTN
+20V	29	A3A2--+20V
+20V RTN	0	A3A2--+20 RTN
+20V	29	A4A1 - C.W.
+20V RTN	0	A4A1 - C.C.W.
+20V INPUT	29 X 2	A1A3 +20V SECT
+20V INPUT RTN	0 X 2	A1A3 +20V RTN SECT

FROM; XTAL OSC A3A1		
DESIGNATION	COLOR	TO
+20V	29	A1A4 +20V SECT
+20V RTN	0	A1A4 +20V RTN SECT
+20V HTR	20	A1A3 +20V SECT
+20V HTR RTN	0	A1A3 +20V RTN SECT

FROM; PHASE LOCK SOURCE A3A2		
DESIGNATION	COLOR	TO
+20V	29	A1A4 +20V SECT
+20V RTN	0	A1A4 +20V RTN SECT
PH VOLT T.P.	69	PH VOLTAGE T.P.FRT PNL
LED (+)	93	ALARM LED (+) FRT PNL
LED (-)	0	ALARM LED (-) FRT PNL

FROM; PIN ATTENUATOR A2A6		
DESIGNATION	COLOR	TO
POS TERM	9	A4A1 C.T.
GND TERM	0	A4A1 C.C.W.

FROM; LEVEL CONTROL POT A4A1		
DESIGNATION	COLOR	TO
C.T.	9	A2A6 (+) TERM
C.W.	29	A1A4 +20V SECT
C.C.W.	0 0	A2A6 (-) TERM A1A4 +20V RTN SECT

FROM; SUMMARY ALARM BOARD A4A3 (OPT 7)		
DESIGNATION	COLOR	TO
+20V PIN-1	29	A1A4 +20V SECT
+20V RTN PIN-2	0	A1A4 +20V RTN SECT
LED (A) PIN-3	93	A3A2 ALM LED (+)

FROM; LEVEL CONTROL POT A4A4 (OPT-1A, 1B)		
DESIGNATION	COLOR	TO
C.T.	9	A2A8 (+) TERM
C.W.	29	A1A4 +20V SECT
C.C.W.	0 0	A2A8 (-) TERM A1A4 +20V RTN TERM

FROM; INT/EXT REF SWITCH A4A5 (OPT-3-6B)		
DESIGNATION	COLOR	TO
TERM #2	29	A1A4 +20V SECT
TERM #5	0	A1A4 +20V RTN SECT
TERM #1	29	A3A6 (+)
TERM #4	0	A3A6 (-)

FROM; INT/EXT LO SWITCH A4A6 (OPT-4)		
DESIGNATION	COLOR	TO
TERM #2	29	A1A4 +20V SECT
TERM #5	0	A1A4 +20V RTN SECT
TERM #1	29	A3A8 (+)
TERM #4	0	A3A8 (-)

FROM; PHASE LOCK SOURCE A3A2 (OPT-6A)		
DESIGNATION	COLOR	TO
+20V	29	A1A4 +20V SECT
+20V RTN	0	A1A4 +20V RTN SECT
LO PH VOLT T.P. (A)	69	LO PH VOLT T.P.A FT PNL
LO PH VOLT T.P. (B)	6	LO PH VOLT T.P.B FT PNL
ALARM LED (+)	93	ALARM LED (+) FT PNL
ALARM LED (-)	0	ALARM LED (-) FT PNL

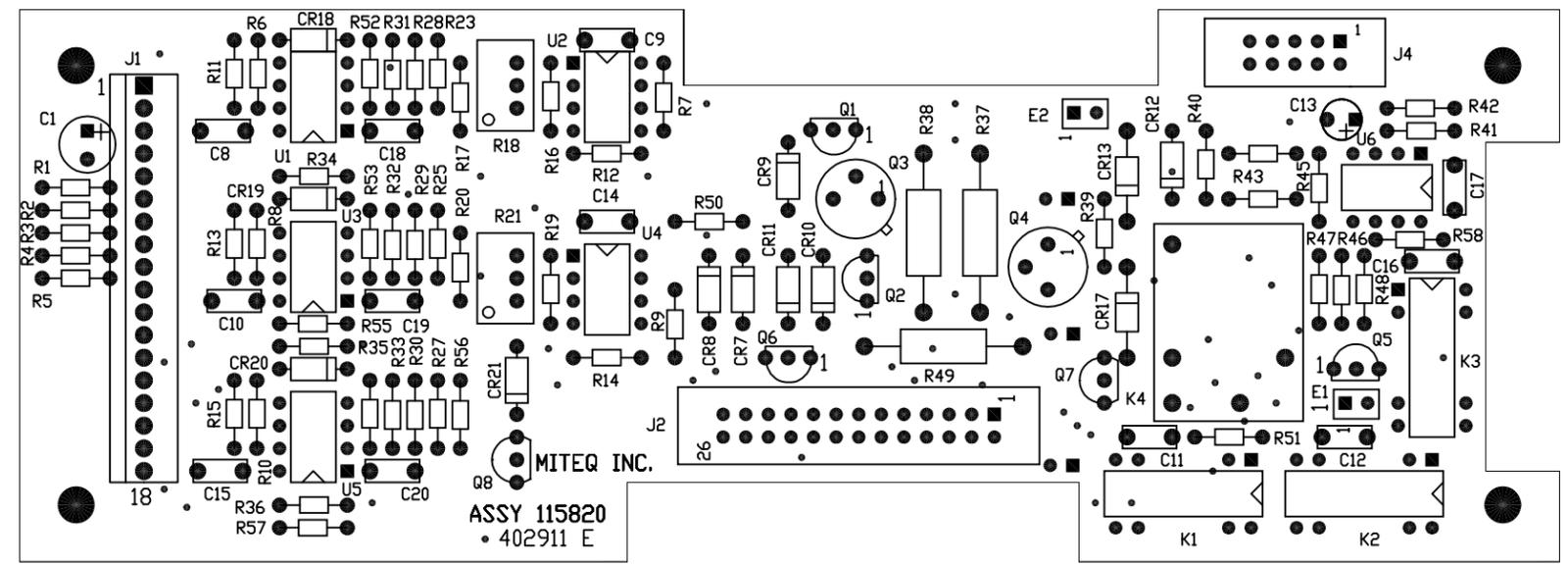
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3

2

1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	F	REVISED PER DWO # 91002105	11/1/00	Rhansen



ASSY 115820
• 402911 E

115820

NOTES:

- FOR COMPONENT VALUES AND PART NUMBERS SEE PARTS LIST.
- INSPECTION CRITERIA FOR ACCEPTANCE OF PRINTED CIRCUIT ASSEMBLY TO BE IPC-A-610, CLASS 2 AND J-STD-001A, CLASS 2, UNLESS OTHERWISE NOTED ON THIS DRAWING.

		-5	-4	-3	-2	-1	NOMENCLATURE OR DESCRIPTION	SYM/NOTES	PART NO.	CODE IDENT.	ITEM NO.			
		QTY REQ'D					PARTS LIST							
ARTWORK	402911	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON					DRN BY		NAME	DATE	 100 Davids Drive, Hauppauge, New York 11788 ASSY/DRILL 8100 SERIES SUMMARY ALARM			
SCHMATIC	115819	DECIMALS ANGLES					CHKD BY							
PANEL ARRAY	130043	.XX±.01 .XXX±.005 ±0°30'					APPROVED BY							
		MATERIAL					PROJ ENGR		NAME	DATE				
		FINISH					ENG SECT				SIZE	CODE IDENT. NO.	REV.	
		NEXT ASSY USED ON					Q.A.				C	33592	115820	F
		APPLICATION					HEAT TREAT				SCALE	REF	25S997	SHEET 1 OF 3

4

3

2

1

D

C

B

A

D

C

B

A

4

3

2

1

D

D

C

C

B

B

A

A

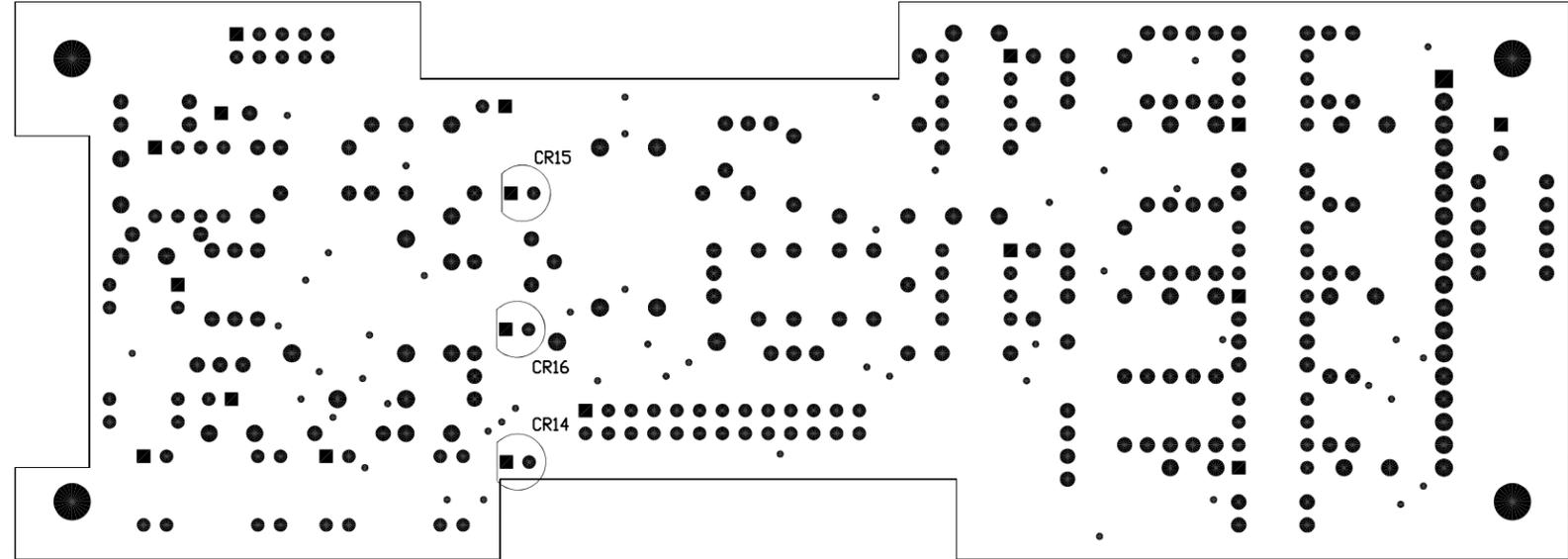
4

3

2

1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	F	REVISED PER DWO # 91002105	11/1/00	Rhansen



115820

		-5	-4	-3	-2	-1	NOMENCLATURE OR DESCRIPTION		SYM/NOTES	PART NO.	CODE IDENT.	ITEM NO.		
		QTY REQ'D					PARTS LIST							
ARTWORK	402911	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON					DRN BY		NAME	DATE	 100 Davids Drive, Hauppauge, New York 11788 ASSY/DRILL 8100 SERIES SUMMARY ALARM			
SCHMATIC	115819						DECIMALS		ANGLES					CHKD BY
PANEL ARRAY	130043	.XX±.01		.XXX±.005		±0°30'		APPROVED BY		SIZE	CODE IDENT. NO.	REV.		
		MATERIAL					PROJ ENGR		NAME	DATE	C	33592	115820	F
		FINISH					ENG SECT				SCALE	REF	25S997	SHEET 2 OF 3
NEXT ASSY	USED ON	HEAT TREAT					Q.A.							
APPLICATION														

WORK ORDER _____ MODEL FS05-101 QUANTITY _____ DATE _____

CUSTOMER MITE @ TESTED BY: _____ Q.C. _____

PARAMETER	TEST RESULTS	ACCEPTANCE LIMITS	TEST RESULTS	ACCEPTANCE LIMITS	TEST RESULTS	ACCEPTANCE LIMITS	TEST RESULTS	ACCEPTANCE LIMITS
LINE REG. 104.4-132 VAC		≤24mV						
0-100% LOAD REG. AT 105VAC		≤24mV						
CURRENT LIMIT AT 132VAC		4.5 TO 5.5 AMPS						
SHORT CIRCUIT CURRENT AT 132VAC		.05 TO 1.5 AMPS						
RIPPLE CONTENT P/P		≤ 5mV						
OVP TRIP POINT		N/A						
DROP OUT VAC		≤104.4 VAC						
OUTPUT AT 115VAC FULL LOAD		+24.0 ± 0.25VDC @ 3.6 AMPS						

NOTE:

REVISIONS					APPROVALS	DATE
ECO	LTR	DESCRIPTION	DATE	APPROVED		
					DRAWN: <i>D. Taylor</i>	2-21-85
					CHECKED:	
					APPVD:	



PARTS LIST


POWER-ONE
 D.C. POWER SUPPLIES

DWG. NO. PL. 53766-102

SHEET 2 OF 3

REV. SEE SHT. 1

ITEM NO.	NOTE	QTY REQD	POWER ONE STD PART NO.	DESCRIPTION.	VENDOR NO.	REF. DES.
1		1	505-54066	PRINTED WIRING BOARD	BD#53764	A1
2						
3		1	154-20937	POTENTIOMETER 500 Ω		R2
4		1	154-20020	POTENTIOMETER 2K		R11
5						
6		2	158-10080	RESISTOR .33 Ω 2W 10% BWH		R4,5
7		3	150-20307	6.8 Ω 1/4W 5% CF		R1,15,16
8		4	-20343	220 Ω		R9,10,17,18
9		1	-20355	1K		R8,
10		1	-20368	24K		R13
11		3	150-20375	RESISTOR 4.7K 1/4W 5% CF		R3,12,14
12	2		-----	RESISTOR		R6,7
13						
14		1	130-10287	I.C. VOLTAGE REGULATOR	μ A723	U1
15	2		-----	TRANSISTOR		Q3
16		REF	171-21545	TRANSISTOR NPN	2N3055	Q1,2
17		1	172-20771	TRANSISTOR	TIP29A	Q4
18		3	111-10001	DIODE 1A 500V	1N4003	CP,1,6,8

PARTS LIST


POWER-ONE
 D.C. POWER SUPPLIES

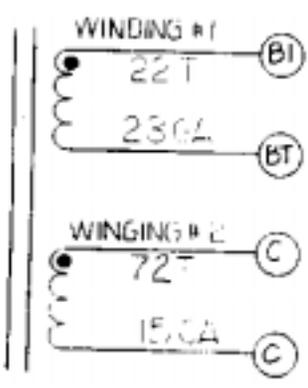
 DWG.
 NO. PL. 53780-102

SHEET 3 OF 3

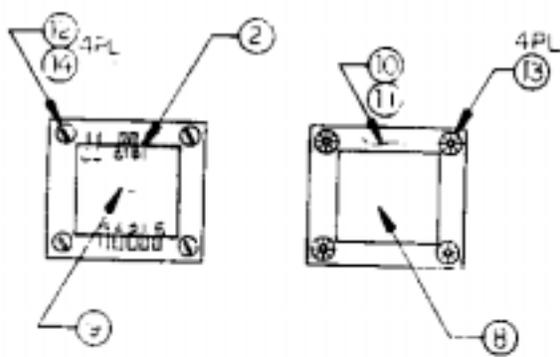
 REV.
 SEE
 SHT. 1

ITEM NO.	NOTE	QTY REQD	POWER ONE STD PART NO.	DESCRIPTION.	VENDOR NO.	REF. DES.
19						
20		4	111-10256	DIODE 6A 50V	MR750	CR 2,3,4,5
21		1	111-20058	DIODE 0.2A 100V	IN4448	CR7
22						
23		1	104-10093	CAPACITOR MYLAR .001uf/16V		C5
24		1	101-10114	ELECT 10uf/25V		C4
25		1	101-10107	ELECT 220uf/16V		C1
26		1	101-10109	ELECT 330uf/35V		C6
27		1	101-21731	CAPACITOR ELECT 7400uf/63V		C2
28	2	—	—	CAPACITOR ELECT		C3
29		1	321-10679	I.C. SOCKET 14 PIN		FOR: U1
30						
31		2	914-21284	WIRE, 20 AWG WHT 3 1/2"		B, ET
32		2	916-21207	WIRE, 16 AWG BLK 4"		C, C
33						
34		1	350-10663	SCREW 2-32 X 1		FOR: Q4
35		1	402-13920	HEATSINK		FOR: Q4

R	ECO	DESCRIPTION	DATE	APPR



3 TO BE VARNISHED WITH UL CLASS B APPROVED METHOD.
 2 CC TO BE SELF LEADS.
 NOTE 1. FOR TAPING PROCEDURE (SEE DNG# 5332)



ITEM	QTY	DESCRIPTION	P/N
15	1	SECONDARY COIL	742-540-14
14	4	WASHER	501-17
13	4	NUTS 8M	540-182
12	4	SCREW 8-32 X 2-1/8	753-21
11	0.76LBS	LAMINATION FLUPEP	620-1-1
10	4.00LBS	LAMINATION MP 2417	753-1-1
9	1	LABEL 11 A7E	753-1-1
8	1	HOUSING	753-1-1
7	1	PRIMARY	753-1-1
6	0.072LBS	28 AWG NLZ WIRE	620-1-1
5	4.774LBS	15 AWG NLZ WIRE	620-1-1
4	.33 FT	TAPE TERM 1011 DNG	753-1-1
3	.75 FT	TAPE SECONDARY	753-1-1
2	2	TERMINAL SECONDARY	753-1-1
1	1	BOBBIN FIT 61.2	753-1-1
		SECONDARY	

APPLY 105 VAC TO TERM 1 & 2

HY POT	VOLTS	TERM VOLT	TERM VOLT	TERM VOLT	APPROVALS	DATE
R1-PR1	500	3-5	87.5		<i>D. J. Montem</i>	2/2/65
R1-SEC	750	3-4	105			
T-GND	3750	C-C	257.1			
C-GND	1500	B-C	17.85			

POWER-ONE
 E.C. POWER SUPPLIES

USED ON: _____

TITLE: **TRANSFORMER**

DWG. NO. _____ REV. _____

SCALE: _____ SHEET OF _____

SEE BRANCE-COURTESY
 1968 NO. 1180

POWER SUPPLY DATA SHEET

DWG # 54106 XL

WORK ORDER _____ MODEL F505-102 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. 104.4-132 VAC		≤ 24mV		≤ 5mV				
0-100% LOAD REG. AT 105VAC		≤ 24mV		≤ 5mV				
CURRENT LIMIT AT 132VAC		4.5 TO 5.5 AMPS		7.0 TO 8.0 AMPS				
SHORT CIRCUIT CURRENT AT 132VAC		.05 TO 1.8 AMPS		.05 TO 3.0 AMPS				
RIPPLE CONTENT P/P		≤ 5mV		≤ 5mV				
OVP TRIP POINT		N/A		5.8 TO 6.6 VDC				
DROP OUT VAC		≤ 104.4 VAC		≤ 104.4 VAC				
OUTPUT AT 115VAC FULL LOAD		+20 ± .025VDC @ 3.6 AMPS		+5.0 ± .025VDC @ 6.0 AMPS				

NOTE: _____

REVISIONS				APPROVALS		DATE
CO	LTR	DESCRIPTION	DATE	APPROVED		
					DRAWN: PNJ	1/4/04
					CHECKED: [Signature]	1/9/04
					APPVD:	



SHEET 1 OF 1

APPENDIX A

PARTS LIST



DWG. NO. PL.54105-101

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	081-54111	PRINTED WIRING BOARD	BD#54109	A1
2		1	082-54108	TRANSFORMER		T1
3		1	412-54107	CHASSIS WITH SILKSCREEN	53668	
4		3	171-21545	TRANSISTOR	2N3055	Q2,3,4
5		3	320-10288	MICA		
6		3	320-10290	MICNABB TO-3		
7		9	350-10206	B.H. SCREWS 6-32 X 7/16		
8		4	340-10603	KEP NUTS 8-32		
9		3	391-20185	SHOULDER WASHER		
10				WIRE LIST (REF. ONLY)		
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

PARTS LIST



DWG. NO. PL. 54111-101

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 - 54110	P.W.B. ASSEMBLY	BO * 54109	A1
2						
3		2	154 - 20020	POTENTIOMETER 2K		R12, 28
		2	154 - 20937	POTENTIOMETER 500 Ω		R4, 22
5	2	---	---	RESISTOR --- --- ---		R35
6		2	158 - 10080	.33 Ω 2W 10% BWH		R24, 25
7		2	158 - 10077	.12 Ω 2W 10% BWH		R8, 9
8		5	150 - 20307	6.8 Ω 1/4W 5% CF		R16, 18, 19, 32, 33
9		1	- 20364	1.6K Ω		R30
10		2	- 20327	47 Ω		R10, 15
11		1	- 20372	3.6K		R14
12		2	- 20343	220 Ω		R17, 27
13		1	- 20356	750 Ω		R13
14		1	- 20351	470 Ω		R9
15		5	- 20361	1.2K		R6, 7, 20, 21, 26
16		2	- 20368	2.4K		R11, 34
17		2	- 20375	4.7K		R23, 31
18		1	150 - 20366	RESISTOR 2K 1/4W 5% CF		R29

PARTS LIST


POWER-ONE
 E.C. POWER SUPPLIES

 DWG.
 NO. PL. 54111 -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		2	130 - 10267	I.C. VOLTAGE REGULATOR	uA723	11, 2
20						
21						
22		REF	171 - 21545	TRANSISTOR	2N3055	Q2, 3, 4
23		2	172 - 20771	TRANSISTOR	TIP29 A	Q1, 5
24						
25		1	160 - 10013	SCR BA 50Y	S050BLS3	SCR1
26						
27		8	111 - 10251	DIODE 1A 200V	1N4003	CR 1, 2, 5, 7, 8, 13, 14, 15
28		6	111 - 10256	DIODE 6A 50V	MR750	CR 3, 4, 9, 10, 11, 12
29		1	112 - 10006	DIODE ZENER 5.6V	1N752 A	CR 6
30						
31						
32		1	101 - 10109	CAPACITOR ELECT 330uf/35V		C12
33		1	10111	1uf/50V		C5
34		2	10114	10uf/25V		C3, 10
35		3	10840	1000uf/25V		C2, 6, 7
36		1	101 - 21730	CAPACITOR ELECT 17,000 / 35V		C1

PARTS LIST



DWG. NO. PL. 54111-101

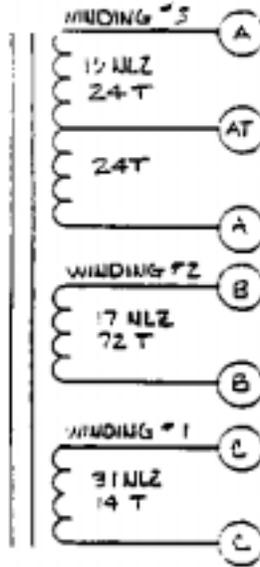
SHEET 4 OF 4

REV. SEE SHT. 1

ITEM NO.	NOTE	QTY REQD	POWER ONE STD PART NO.	DESCRIPTION.	VENDOR NO.	REF. DES.
37		1	101-21731	CAPACITOR ELECT 7400uf/63V		C E
38		1	104-10092	CAPACITOR MYLAR .0033uf/100V		C 4
39		1	104-10093	CAPACITOR MYLAR .001uf/100V		C 11
40						
41						
42						
43		2	321-10679	I.C. SOCKET 14 PIN		FOR: U1 & U2
44		2	350-10663	SCREW 6-32 X 1"		FOR: Q1, 5
45		2	402-13920	HEATSINK, 3/4"		FOR: Q1, 5
46						
47				WIRE		
48				WIRE		
47						
48						
49						
50						
51						
52						

FILE NUMBER: 71.66%

REV	ECO	DESCRIPTION	DATE APPR



A A A 6 B B 7 C C C

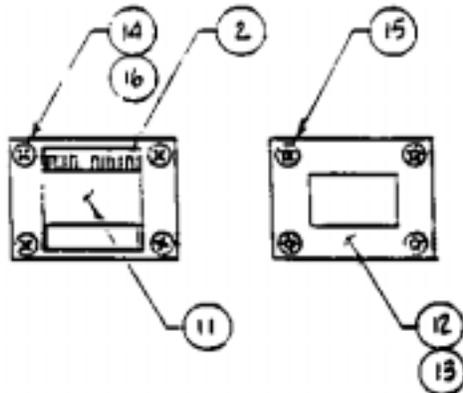


- MANUFACTURE PER P-O W/S 59857
- MARK PER P501002
- VARNISH PER P501001

SELF LEADS

1. TAP PER P501004

NOTES:



ITEM	QTY	DESCRIPTION	P/N
16	4	WASHER	391-10202
15	4	NUT PRESS	340-1029F
14	1	VIEW P 32x 2 VR	253-7172
13	0.7 LBS	LAMINATION 17.5LX	240-10114
12	4.00 LBS	LAMINATION MR 24GA	231-10103
11	1	LABEL PLATE	274-5089b
10	1	HOUSING	200-50477
9	1	SECONDARY COIL	092-54108
8	1	PRIMARY COIL	091-53632
		ASSEMBLY, AFMR	082-54108
7	.3102 LBS	WIRE 15 NLZ	260-101
6	.3016 LBS	WIRE 17 NLZ	260-10734
5	.0023 LBS	WIRE 31 NLZ	260-10148
4	.33 FT	TAPE, TRFM TAPE-DOWN	240-21126
3	1.50 FT	TAPE, SECONDARY	240-20781
2	2	TERMINAL SECONDARY	250-50418
1	1	SOLENOID EE 1.25X1.6	200-50476
		SECONDARY COIL	092-54108

APPLY 1/2 VOLT AT TERMINALS 1 & 2

HY POT	VOLTS	TERMINAL	VOLTAGE RATIO TEST-PRIMARY TERMS	ITEM	QTY	DESCRIPTION	P/N

Power-One
A POWER SUPPLY

USED ON: FS05-102

TITLE: TRANSFORMER

DWG. NO. 54108

SCALE: — SHEET 1 OF 1

REV. 22

FORM 1-64 (REV. 1-64)