ADC

TELECOMMUNICATIONS

TECHNICAL MANUAL
EXHIBIT II

(PRELIMINARY)

6452A

BROADBAND TRANSLATOR

REV: 0

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6452A
BROADBAND TRANSLATOR

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SYSTEM DESCRIPTION

The 6452A Boradband Translator is a multi-channel translator designed to be used by wireless cabel operators to provide MMDS/ITFS service without the added expense of a headend. The unit inputs multichannel superband (222 to 408 MHz) then upconverts and amplifies the signal to RF. The power capability of the unit varies with the number of channels according to specifications with a peak envelope power of 6.0 watts.

This manual covers the description, installation, set-up, operation, schematic and interconnect drawings, as well as other useful technical information.

TECHNICAL MANUAL DESCRIPTION

This manual has been provided to assist with the set-up, operation, and maintenance of the translator. The System section of the manual offers a brief system description, block diagrams, interconnect, front panel description, rear panel description, and a specification sheet. If after reviewing this manual, you still have questions, please contact the ADC Service Company at (724) 941-1500. A Customer Service Technician will be glad to assist you.

SPECIFICATIONS: 6452A Broadband Translator

Type of Emissions ..... TRANSLATOR (Analog)
Frequency Range ..... 2500 to 2690 MHz (any 6 MHz channel)
DC voltage and total current of final amplifier stage ..... 10 volts DC at 9.8 amps
(Class A - Not RF power dependent)
Total Output Power Rating ..... 6.0 watts peak envelope
Adjustable in the translator translator tray (1.0 watts total average)

Performance Specifications

Operating Frequency Range ..... 2500 to 2690 MHz
RF Output - Nominal:
Impedance ..... 50 Ω
Connector ..... Type N
Power:
4 Channels ..... 250 mW/channel
8 Channels ..... 125 mW/channel
12 Channels ..... 83.3 mW/channel
16 Channels ..... 62.5 mW/channel
24 Channels ..... 41.7 mW/channel
31 Channels ..... 32.3 mW/channel

Nominal Input Signal Range (average power): ..... -32 to -17 dBm/Channel
Connector ..... Type N
Impeadance ..... 50 ohm

Out-of-Band Power ..... Per FCC Rules (21.908)
-25 dB max (at band edges):
-40 dB max (250.00 KHz above and 250.00 KHz below band edges):
-50 dB max (3.00 MHz above and 3.00 MHz below band edges):
-60 dB max (20.00 MHz above and 20.00 MHz below band edges):

Out-of-Band Power (Unoccupied Channel) ..... Per FCC Rules (21.908)
-25 dB max (at unoccupied channel edges)
-40 dB max (250.0 KHz above and 250.0 KHz below occupied channel edges)
-50 dB max (3.0 MHz above and 3.0 MHz below occupied channel edges)

Harmonic Products ..... -60 dB max

Electrical Requirements

Power Line Voltage ..... 110 VAC ±10%, 60 Hz/240 VAC±10%, 50/60 Hz

Power Consumption (System) ..... 11,145 Watts

Environmental

Maximum Altitude (System) ..... 12,000 feet (3,660m)
Ambient Temperature (system) ..... 0° to 50°C

Mechanical

Dimensions: (WxDxH)
Translator Tray ..... 19" x 21" x 8.75" (48.3cm x 53.3cm x 22.2cm)

Weight:
Translator Tray ..... 55 lbs. (24.9 kgs)

INSTALLATION PROCEDURE

UNPACKING

ADC Telecommunications certifies that upon leaving our facility, your equipment was undamaged and in proper working order. Please inspect all material upon arrival for any sign of damage. The shipping container should be examined for obvious damage indicative of rough handling. Remove the translator and all other material from the shipping container and check for damage: dents, large scratches, or broken connectors etc. Open the translator and remove all packing material from inside the unit and inspect for damage. Any claims against in-transit damage should be directed to the Carrier.

SITE CONSIDERATIONS

Since the 6452A is tray based, it must be mounted in a 19" equipment rack. This cabinet must be housed in an environmentally controlled cabinet or building. It is also very important to verify that adequate AC power is available.

Complete the following for equipment installation:

If the unit is supplied with a cabinet, carefully remove the cabinet from the shipping container. If the translator tray has been shipped separately, the internal shipping material must be removed from inside the cabinet before the tray is installed. Cut and remove the cable ties or cords which hold the tray harness breakouts to the tray slides. Carefully remove the foam packing material from around the cables, connectors and slides. Do **not** use a knife or other sharp object, as these may cut into the harness wires. Once the cabinet has been properly positioned, the trays can now be installed.

Extend the cabinet mounted slide rails out to their full and locked position. Place the tray with the slides into the cabinet slide rails until the tray locks into place. Press the side lock tabs on the rails to unlock the tray and carefully move the tray completely into the rack. Check that the cable breakouts in the rear are not caught on the tray as the tray is slid into place.

If the trays were shipped mounted in the cabinet, a front and rear shipping bracket must be removed in order to allow the trays to be pulled out.

If the tray does not slide in and out of the cabinet smoothly, loosen the hardware holding the slides in place. Move the tray accordingly and tighten the hardware again. Repeat if necessary until the tray slides in and out freely.

Next, secure the small cable retractors (attached to the main harness) to the back of the tray by sliding them into the clip located between the AC hook up and the fan on the back of the tray.

Connect the wires to the back of the tray. Each wire is marked with a number corresponding to the location where it should be connected to the back of the tray.

CABINET NOT SUPPLIED

Two tray slides are provided with the translator. Locate the left slide (without the cable retractor) and mount the slide to the left side of the cabinet (looking from the rear) using the supplied hardware. Refer to the Cabinet Mounting Diagram for further detail. Check that the slide is level from front to back.

NOTE: Allow a clearance of approximately 5 inches between the point from where the stationary section is attached to the cabinet slide and the rear cabinet mounting rail to permit proper operation of the cable retractors.

Install the remaining slide to the right side of the cabinet. Install the long retractor and hinge bracket to the stationary section of slide using the supplied hardware.

Extend the cabinet mounted slide rails out to their full and locked position. Place the tray with the slides into the cabinet slide rails until the tray locks into place. Press the side lock tabs on the rails to unlock the tray and carefully move the tray completely into the rack. Check that the cable breakouts in the rear are not caught on the tray as the tray is slid into place.

ADJUST TRAY ASSEMBLY.

Check to see that the tray slides freely with no interference from other assemblies. If not, some adjustment can be made by sliding the tray out, loosening the front or rear mounting bolts of the slide assemblies, and moving the tray in the direction required for smooth operation. After the adjustment has been made, firmly tighten the mounting bolts and check the movement again. Repeat if necessary.

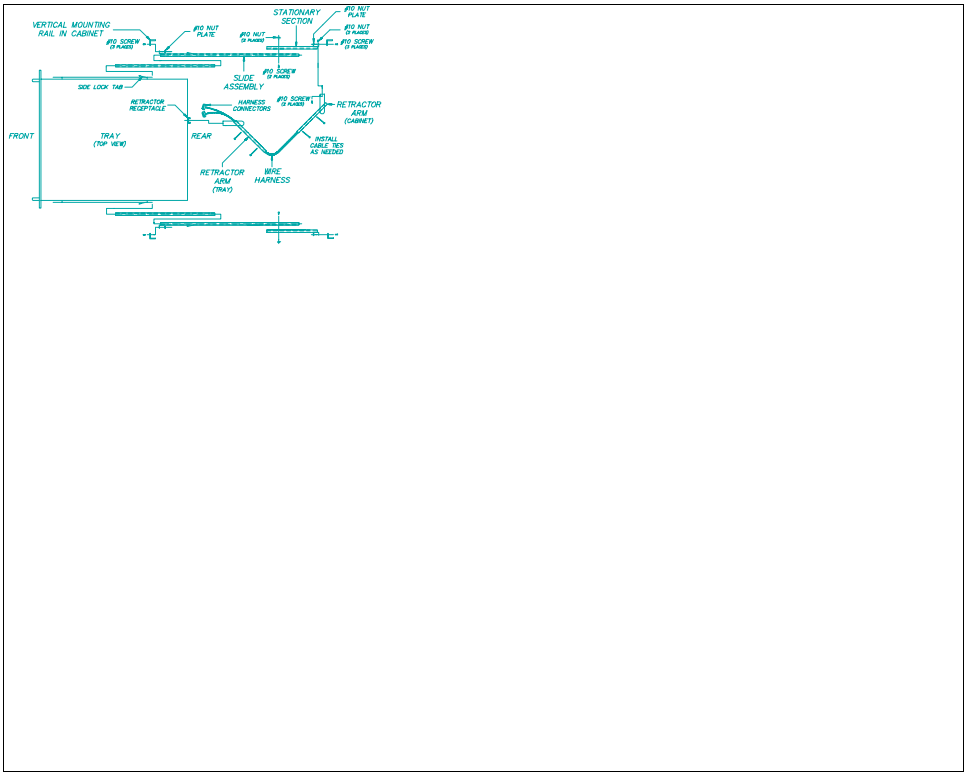
INSTALL CABLE RETRACTOR ASSEMBLY.

The Cable Retractor Assembly consists of two parts; (A) a cabinet retractor and (B) a tray retractor.

A) The cabinet retractor consists of a short aluminum channel hinged to a mounting bracket that is to be placed on the right side (looking from the rear) of the cabinet slide assembly. Refer to the Cabinet Mounting Diagram for further detail.

B) The tray retractor is a short aluminum channel hinged to a slide bracket. The bracket slides down into the retractor receptacle which is located at the rear of the tray.

Both retractors work together to avoid pinching the wiring when the tray is moved in or out.



SYSTEM CHECK OUT AND OPERATION PROCEDURE

ELECTRICAL INTERFACE PROCEDURE

With the unit properly installed and adjusted in the equipment rack, the process of electrically interfacing the translator can begin. The following steps should be completed:

INSTALL AC LINE CORD.

Cabinet Supplied

For installations where the cabinet has been supplied, the AC line cord has been pre-wired into the main harness. Proceed to the section following "Cabinet not Supplied".

Cabinet Not Supplied

A line cord is provided with each translator tray. Insert the female connector of the line cord into the tray's AC input connector (J1). Make certain that the rear panel power switch is in the "OFF" position, then plug the line cord into an appropriate AC outlet to power the tray.

NOTE: The 6452A was designed for either 117 VAC/60 Hz or 220 VAC/50 Hz. operation. It has been shipped from our factory properly configured for the standard of the country of destination. If you wish to change the AC configuration, please consult the factory.

CAUTION: **Never remove the RF output coaxial cables or otherwise unload the translator RF outputs while operating. This may cause harmful exposure to RF radiation.**

CONNECT RF OUTPUTS AND RF INPUTS:

Connect the output coaxial cables from the RF Output of the Waveguide Comnbiner to the transmit antenna. Connect the RF input coaxial cable (J6) from the translator amplifier to the upconverter output (J5).

Connect the upconverter input (J4) to 138-324 MHz or 222-408 MHz (depending on model) cable feed. Connect 10 MHz input (J3) to 10 MHz reference if used.

INITIAL TURN ON PROCEDURE

Before beginning routine operation, the unit should be given a step-by-step check of its functions to verify proper interface and operation. This will give the operator a chance to become familiar with the unit. The following procedure should be followed for the initial turn-on of the unit:

1. APPLY AC POWER TO TRANSLATOR.

Move the translator rear panel AC switch to the **ON** position. The **THERMAL INTERLOCK** LED on the front panel will illuminate. This indicates that the thermal interlock is satisfied. If this is not the case, you should then refer to the troubleshooting section of this manual.

2. OPERATE TRANSLATOR

Move the translator to **OPERATE**. This should cause the **OPERATE** indicator to illuminate (if not, refer to troubleshooting section). Remove the tray's cover and observe the single LED indicator on the 1 Section Bias Protection Board (10 watt translator), or four LED indicators on the 4 Section Bias Protection Board (20 Watt translator), or the six LED indicators on the 6 Section Bias Protection Board (50 Watt translator). Each LED indicator should be illuminated indicating that all GaAs FET devices are operating properly.

3. MONITOR FORWARD OUTPUT POWER.

Now that the control and DC functions of the translator have been established as operative, move the translator metering select switch to the **FWD PWR. (0-100%)** position and verify that the meter indicates 100% on the **% POWER** (top scale) position of the meter.

NOTE: If the translator is being used as a driver, the meter reading on the add-on amplifier should indicate 100% while the translator will indicate a level less than 100%.

4. MONITOR REFLECTED POWER.

Move the translator metering select switch to the **REFL. PWR (0-100%)** position and verify that the meter typically indicates less than 10% on the **% POWER** scale.

5. MONITOR ALC

Move the translator metering select switch to the **ALC. (0-10VDC)** position and verify that the meter indicates about 2.5 VDC on the bottom scale.

RECORD LEVELS ON LOG SHEET

Once the translator is operating at full power, record all metered levels of the translator on a dated and initialed sheet. This sheet can be used for future comparison of the unit's operation. Comparing this information to the factory test data is always a good practice.

NORMAL OPERATION

Once the Installation and the Initial Turn-on are complete, operation is simple. With the AC ON/OFF switch in the **ON** position, the translator is activated by moving the **OPERATE/STANDBY** switch to **OPERATE**. This will now enable the translator. All of the green front panel operating status indicators should illuminate and the power metering should display a percentage of output power. To control the translator's output power, adjust the translator power control. To turn the translator off simply move the translator to **STANDBY** and turn the AC ON/OFF switch to **OFF**.

A problem with the translator will usually reveal itself by a loss (either total or partial) of power. If there is no power at the output of the tray, check to see that the AC switch is **ON** and the translator is in the **OPERATE** mode. If so, consult the troubleshooting section of this manual.

Small changes in the output power are acceptable, but if the translator must be adjusted 10 to 20 percent or more to maintain the desired output power, there may be a problem in the translator's amplifier section. Refer to the troubleshooting section of this manual.

1. ALC SET UP PROCEDURE

The output power of the translator is preset from the factory for an output level which corresponds to a Multi-channel Carrier to Composite Triple Beat (C/CTB) ratio that is equal to 60dB with CW carriers. If a different ratio of C/CTB is desired, the ALC can be manually adjusted to give a lower or greater output.

- With the translator in **operate**, turn the meter knob to ALC and observe the front panel meter. The meter should indicate 1-8 volts when the average output power level is within the effective operating range of the ALC circuitry.

- If the ALC voltage reading drops below 0 volts, this indicates that the input signal has risen above the ALC window and the yellow **overdrive** indicator which is on the front panel will light.

- If the ALC voltage exceeds 10 volts, this indicates that the input signal has fallen below the acceptable ALC window and the red **low output level** indicator will light.

  If either extreme is the case, additional attenuation or preamplification may be needed to achieve the proper ALC range.

2. ALC ADJUSTMENT

If the front panel meter indicates a proper operating level, yet distortion is still detected in the output picture signal, the ALC level should be adjusted manually. To adjust the ALC reference level, move the ALC/MAN jumper (W1) on the ALC Control Board (1510-1103) to the ALC position. Adjust R9 counterclockwise to reduce the average output level, or clockwise to increase the average output power to the proper operating level.

The ALC can be disabled by moving the jumper to the MAN position. The MAN GAIN potentiometer (R12) now becomes the direct adjustment for amplifier gain. The manual potentiometer should be adjusted for a normal average output power so that the C/CTB with modulated carriers is at least 47 dB for best picture quality.

This completes the ALC set up for the Translator.

FRONT PANEL CONTROLS

The following controls and indicators are located on the front panel of the **ITS-717** Translator:

FUNCTION	PURPOSE	TYPE OF DEVICE
OPERATE/STANDBY	ENABLES AND DISABLES THE TRANSLATOR	SWITCH
FORWARD POWER	INDICATES % OUTPUT POWER ON THE TOP METER SCALE	SELECTOR SWITCH/METER
REFLECTED POWER	INDICATES % OF REFLECTED POWER	SELECTOR SWITCH/METER
ALC	INDICATES ALC VOLTAGE (BOTTOM SCALE)	SELECTOR SWITCH/METER
THERMAL INTERLOCK	ILLUMINATION INDICATED THAT AN AMPLIFIER OVERTEMPERATURE FAULT IS NOT PRESENT	GREEN LED
LOW OUTPUT	ILLUMINATION INDICATES THAT THE OUTPUT IS BELOW NORMAL	RED LED
OVERDRIVE	ILLUMINATION INDICATES THAT THE OUTPUT IS ABOVE NORMAL	YELLOW LED
TRANSLATOR FAULT	ILLUMINATION INDICATES THAT A FAULT CONDITION EXISTS IN THE TRANSLATOR	RED LED
OPERATE	ILLUMINATION INDICATES THAT THE TRANSLATOR IS ENABLED	GREEN LED
STANDBY	ILLUMINATION INDICATES THAT THE TRANSLATOR IS DISABLED	YELLOW LED
PLL LOCK	ILLUMINATION INDICATES THAT THE VHF GENERATOR PLL IS LOCKED	GREEN LED
PLL REFERENCE	ILLUMINATION INDICATES THAT AN INTERNAL OR EXTERNAL REFERENCE SOURCE IS PRESENT	GREEN LED

REAR PANEL CONNECTIONS

INPUT/OUTPUT	CONNECTOR NUMBER	CONNECTOR TYPE	FUNCTION
RF INPUT	J6	N	PROVIDES RF INPUT FROM THE UPCONVERTER
RF OUTPUT	J7	N	PROVIDES RF OUTPUT FROM THE TRANSLATOR
PREAMP POWER	J2	F	PROVIDES +21 VDC TO AN EXTERNAL PREAMP (not used)
ON/OFF	CB1	10A BREAKER	PROVIDES AC CONTROL AND CIRCUIT BREAKER PROTECTION
AC	J1	IEC	PROVIDES AC INPUT TO THE TRANSLATOR
CONTROL/REMOTE	J8	25 POS MALE D	PROVIDES ACCESS TO REMOTE STATUS AND CONTROL FUNCTIONS OF THE TRANSLATOR
MONITOR/REMOTE	J9	25 POS MALE D	PROVIDES AN EXTERNAL OUTPUT TO MONITOR FORWARD POWER, REFLECTED POWER, AND ALC VOLTAGE
UPCONVERTER INPUT	J4	F	PROVIDES RF INPUT FROM CABLE FEED
UPCONVERTER OUTPUT	J5	BNC	PROVIDES RF OUTPUT FROM THE UPCONVERTER
10 MHz IN	J3	BNC	PROVIDES AN INPUT FROM AN EXTERNAL REFERENCE SOURCE

INTERNAL INDICATORS

BOARD	REFERENCE	FUNCTION
A10- 1 SECTION BIAS BD. ITS-705	DS1 MODULE FAULT	ILLUMINATION INDICATES THAT AN OUTPUT AMPLIFIER FAULT IS NOT PRESENT
A10- 4 SECTION BIAS BD. ITS-706	DS1-DS4 MODULE FAULT	ILLUMINATION INDICATES THAT A DRIVER OR OUTPUT AMPLIFIER FAULT IS NOT PRESENT
A10- 6 SECTION BIAS BD. ITS-707	DS1-DS6 MODULE FAULT	ILLUMINATION INDICATES THAT A DRIVER OR OUTPUT AMPLIFIER FAULT IS NOT PRESENT
A17-ALC CONTROL BD.	DS1	ILLUMINATION INDICATES THAT ALC IS IN OPERATE
A3- ±12V POWER SUPPLY BD.	DS1-DS6	ILLUMINATION INDICATES PROPER OUTPUT FROM EACH ASSOCIATED REGULATOR.

MAINTENANCE AND TROUBLESHOOTING

Problem Identification

The translator consists of several amplifier modules and supporting circuitry. If the driver stages are not at fault, first note the symptoms of the problem that is present. Most amplifier faults relate to low or no output power and/or signal quality problems. If there is no output power from the amplifier, first check to determine if the amplifier is being supplied the proper AC and control input commands. If the amplifier is operating but producing no output, check all of the LED indicators on the front panel and inside of the amplifier to determine if any of the green LEDs are not lit. If a green LED is found not lit, the troubled section of the system is most likely to be in that area. If all DC and control functions seem normal, it is necessary to quantify the performance problem and then determine the possible causes. **If an effort is being made to contact the factory to assist in problem identification, please record the status of all indicators, meter readings and signal quality measurements so that these important parameters may be related to the factory.**

Problem Analysis

In most cases, the performance of a GaAsFET transistor is closely tied to the DC operation of the system. Any degradation in signal quality, gain or power is usually related to a corresponding change in a DC parameter somewhere in the system. An exception may be a defective RF input or output connection which can result in poor performance of the amplifier with all DC parameters appearing normal.

The first step of analysis is therefore to carefully measure all DC parameters and compare these to the numbers indicated on the schematics, block diagrams, and factory test data sheet. The FLM2527 GaAsFETs operate at about +10 volts on the drain and bias at 4.8amps. Use the current sense resistors on the bias board to measure these currents. The FSX52 and FLL-171 located inside the 3 stage amplifier module operate at 75mA and 400mA. Use the current sense resistors located inside the 3 stage module to measure the current.

If all DC parameters are normal, an RF intermittency should be suspected. Follow the RF path from input to output and apply a small physical force on all connectors while observing the output power. If an intermittency is detected, a simple resoldering can be attempted.

While following these procedures, it is important to maintain terminations on all amplifier circuits to avoid VSWR damage. Before a fan fails, it normally begins to exhibit noisy operation. Always check for free fan blade movement and procure a replacement fan if fan bearing noise is evident.

Repair Procedures

Repair of this translator assembly normally involves module level replacement. ADC Telecommunications maintains an adequate stock of replacement modules. If you have determined that a particular subassembly is defective and that it cannot be easily repaired at your facility, please contact the ADC Costumer Services Department. An effort will be made to provide a module on an exchange basis. It is often possible to ship replacement modules counter-to-counter or one-day UPS/Federal Express to expedite delivery.
On some occasions it is necessary to perform component level repairs. In many cases failures can be a result of poor connections somewhere in the system. Poor connections can generally be repaired with a suitable, small, grounded soldering iron. A spare parts kit of standard components is available for this translator. Please contact the ADC Marketing Department for the price and availability of the spare parts kit. Individual components can also be ordered from the Customer Services or Marketing departments of ADC. The fuses are standard and generally available at local parts distributors. The parts list provides complete manufacturer's information and part number for all standard electrical components. These components can often be obtained from local distributors. An effort has been made to select standard (off-the-shelf) components whenever possible in the product design. Replacement of the GaAsFET transistors in the field is not recommended unless performed by an experienced technician. It is important to realize that each GaAs FET operates at a specific bias voltage that must be preset before the main power supply is switched on. Failure to provide the proper bias voltage will result in rapid GaAsFET destruction. Please refer to the ITS Warranty and Material Return Authorization procedures for additional information concerning repair parts.

Periodic Procedures

This translator is designed with components that require no periodic maintenance except for cleaning and record keeping.

The amount of cleaning necessary depends greatly on the conditions in the translator room. While the electronics have been designed to function well even if covered with dust, heavy buildups of dirt and insects will impede the effectiveness of the cooling and lead to shutdown or premature failure.

When it is apparent that the front panel is becoming dust covered, the top cover should be opened and the accumulated foreign material removed. A small, soft brush used in conjunction with a plastic wand-like attachment on a small vacuum cleaner is an excellent way to remove dirt. Alcohol and other cleaning agents should not be used unless you are certain that the solvents will not damage components or markings. Water based cleaners can be used if only a small amount of moisture is used. The fans or heat sinks should be carefully cleaned.

Occasionally check that all RF connections are secure, but be careful not to overtighten.

Data should be recorded for all meter readings on a regular basis. It is suggested that data be recorded once each month and that it be retained in a rugged folder or envelope for the life of the equipment. A sample format of a log sheet is included at the end of this section. Photocopies of this sheet may be used for if desired.

Oscillator Calibration

The FCC requires that the local oscillator should be checked once each month. If the LO is found to be off frequency, the following procedure should be followed. The data resulting from this procedure should be logged for future reference. A frequency counter that is capable of 5×10^{-9} stability and a voltmeter are required.

1. CALCULATE LOCAL OSCILLATOR FREQUENCY

A) Measure the VCXO frequency at J16 ($f_{(s)}$) on the VHF Generator Board (10 digits)

B) Using a 10 digit calculator, perform the following calculation

$$LO = [\ 24 \times f_{(s)}]$$

The result should be the desired LO frequency ±500 Hz (ADC Spec) or ±1000 Hz (FCC Spec)

2. MEASURE FREQUENCY OF OPTIONAL INTERNAL 5 or 10 MHz REFERENCE OSCILLATOR

Connect a frequency counter to J1 (5/10 MHz output SMA) which is located on the 5 or 10 MHz Reference Oscillator Assembly. Verify that the counter indicates 5 or 10 MHz. ±.9 Hz. Adjust C2 on reference oscillator if necessary for the exact frequency.

3. CALIBRATE VCXO LOOP RANGE

If the PLL is locked (DS1 not lit on the VHF Generator Board) connect a voltmeter between TP2 (probe) and chassis (ground lead) on the VHF Generator Board. The meter should indicate a reading from -2.5 to -3.5V. If the reading is not within this range, adjust C11 (coarse adjust) on the VHF Generator Board for a reading of 3.0 V. Connect a frequency counter to J16 ($f_{(s)}$) on the VHF Generator Board. Verify that the VCXO frequency is correct.
If the PLL is not locked or the desired voltage range at TP2 can not be obtained, please consult that factory.

TROUBLESHOOTING

Problem Identification

The first step in solving a problem with the translator is identifying the nature and location of the problem. Since the translator consists of many different boards and modules, it is often difficult to determine which part is causing the problem. The best method of isolating the problem is to divide the booster into three discrete sections and determining if these sections are operating correctly. The three sections are:

- ☞ Power Supplies
- ☞ Amplifier Modules
- ☞ ALC and Control Circuits

★First, check that all RF connections between the translator, cable feed, and antennas are correct and secure.

Note the symptom(s) of the problem that is present, including the status of the LED indicators located on the front panel. If the booster has no output, check that the **operate/standby** switch (S1), located on the front panel, is set to **operate**. If the translator remains inoperable, check the LED indicators within the translator and verify that all indicators are lit. If an indicator is found not to be lit, the fault is most likely to reside in the section associated with that indicator.

Refer to the diagnostic chart on the pages that follow for common symptoms and probable causes. Also refer to the Upconverter Interconnect Drawing (1509-8100) and Block Diagram (1509-3100), as well as the Amplifier Interconnect (1510-3100) and block diagram (1510-3100) for point-to-point troubleshooting assistance and signal level indicators.

FRONT PANEL DIAGNOSTIC CHART	
SYMPTOM	**CHECK**
DS5 GREEN OPERATE LED NOT LIT	**ON FRONT PANEL** 1. CHECK IF S2 IS IN OPERATE. 2. CHECK IF DS1 THERMAL INTERLOCK LED IS ON. IF OFF, A THERMAL PROBLEM EXISTS IN THE TRANSLATOR. **ON (A15) TRANSMITTER CONTROL BOARD** 1. CHECK J1-3,5 FOR ±12 VDC. CHECK DS1-6 ON ±12 VDC POWER SUPPLY BOARD. IF NOT LIT, CHECK F1 AND F2 FUSES.
DS2 RED LOW OUTPUT LEVEL LIT	**ON (A16) FRONT PANEL METER <u>IMPORTANT: SET S1 TO ALC</u>** 1. INDICATES ALC VOLTAGE ABOVE SET LEVEL, NORMALLY CAUSED BY LOW LEVEL INPUT. 2. CHECK THE INPUT LEVEL TO TRANSLATOR IS AT LEAST -30 dBm. **ON (A10) SIX SECTION BIAS PROTECTION BOARD (1500-1104)** 1. DS1 NOT LIT, INDICATES (A13-1) 3 STAGE AMPLIFIER MODULE (1510- 1106) NOT OPERATING CORRECTLY. 2. DS2-6 IF NOT LIT, INDICATES (A13-2) 50 WATT AMPLIFIER MODULE (1500-1107) IS NOT OPERATING CORRECTLY.
DS3 YELLOW OVERDRIVE LED LIT	**ON (A16) FRONT PANEL METER <u>IMPORTANT: SET S1 TO ALC</u>** 1. ALC VOLTAGE > ZERO, TYPICALLY CAUSED BY A HIGH NPUT 2. CHECK THE INPUT LEVEL TO TRANSLATOR IS LESS THAN -20 dBm.
DS1 GREEN LED THERMAL INTERLOCK NOT LIT	CHECK THERMAL SWITCH (A13-3) MOUNTED ON THE HEATSINK OF THE AMPLIFIER MODULES. MODULES DRAWING TOO MUCH CURRENT. CHECK DS1 AND DS6 ON THE SIX SECTION BIAS PROTECTION BOARD. (SEE BELOW)
DS8 GREEN LED PLL LOCK NOT LIT	CHECK VHF GENERATOR BOARD FOR ±12 VDC. IF DS1 IS LIT, CHECK FREQUENCY.
DS7 GREEN LED PLL REFERENCE NOT LIT	CHECK VHF GENERATOR BOARD FOR 50KHz.CHECK 5 OR 10MHz OSCILLATOR.
DS4 RED TRANSLATOR FAULT LED LIT	CHECK FORWARD POWER READING (100%). CHECK DS1-DS6 ON 6 SECTION BIAS BOARD. CHECK FOR LOW RF INPUT AT J4.

Check the Level II Diagnostics LEDs located on the printed circuit boards within the translator. Refer to the Diagnostic Chart below for common symptoms and probable causes.

INTERNAL BOOSTER DIAGNOSTIC II CHART	
SYMPTOM	**CHECK**
DS1-6 GREEN LED ON SIX SECTION BIAS PROTECTION BOARD NOT LIT	CHECK VOLTAGE J2-1 AND J3-1,5,6,7,8 FOR +10 VDC. CHECK FUSES F1-F6. CHECK VOLTAGE AT TB1-1,4 FOR +10.2 VDC.
DS1-5 GREEN LED ON ±12 VDC POWER SUPPLY BOARD NOT LIT	CHECK U1-U5 FOR +12 VDC. CHECK A3-J1-5 FOR +18 VDC. CHECK A2 BRIDGE RECTIFIER. CHECK FUSE F1.
DS6 -12 VDC GREEN LED ON ±12 VDC POWER SUPPLY BOARD NOT LIT	CHECK U6 FOR -12 VDC. CHECK AC VOLTAGE AT A3-J9-3 AND J9-1. CHECK FUSE F2.

★If factory assistance is needed in locating the problem, please record the status of all LED indicators, DVM readings and signal quality measurements so that these important parameters may be related to the Field Service Technician. Readings from the system before the problem occurred are also helpful to the Customer Service Technician.

MAINTENANCE

The 6452A Translator is designed with components that require little or no periodic maintenance.

Six LED indicators are located on the front panel to provide an indication of the translator's operating status. DS5, a green **operate** LED, indicates that the translator is in transmit and the **operate/standby** switch located on the front panel is in the **operate** mode. DS2, a red **low output level** LED, indicates that the output level is too low. DS3, a yellow **overdrive** LED, indicates that the amplifier stages within the translator are being over-driven which can cause distortion in the output signal. DS4, red **translator fault** LED, indicates that a fault condition exist with in the translator. DS1, green **thermal** LED, indicates that no amplifier is over temperature.

A thermal switch is provided within the translator assembly to furnish protection should a thermal condition arise. The switch is mounted directly to the heatsink assembly. A thermal condition will cause the thermal switch to close. This closure is sensed by the Transmitter Control Board which in turn disables the translator and de-energizes the Relay that provides 110 or 220 VAC to the +12 VDC Switching Power Supplies. The translator will remain disabled until the thermal condition is no longer present and normal operation will resume.

☎TELEPHONE TECHNICAL SUPPORT

To obtain technical assistance call (724) 941-1500 8am to 5pm EST.

Please prepare the following information before calling in order to receive the best service from your Customer Service Technician.

_ Model Number

_ When the problem started

_ LED's, which are on? Off?

_ Scope or meter readings

_ Have this manual with you when placing the call.

After regular business hours your call is automatically answered by voice mail and options given. Follow the steps given to obtain assistance.

Please leave a message that includes your name, phone number, and a brief description of the difficulty you are experiencing. A customer service technician will be contacted and return your call at the earliest opportunity.

6452A
BROADBAND TRANSLATOR

TRANSLATOR TRAY
DRAWING LIST (SUBASSEMBLIES)

Note: The following schematics can be found in the of the Schematics Attachment.