TECHNICAL MANUAL
888-2001-856

AUTOMATIC OSCILLATOR INTERFACE
992-8195-002

T.M. No. 888-2001-856

Rev. A1: 09/30/04

Returns And Exchanges

Damaged or undamaged equipment should not be returned unless written approval and a Return Authorization is received from HARRIS CORPORATION, Broadcast Systems Division. Special shipping instructions and coding will be provided to assure proper handling. Complete details regarding circumstances and reasons for return are to be included in the request for return. Custom equipment or special order equipment is not returnable. In those instances where return or exchange of equipment is at the request of the customer, or convenience of the customer, a restocking fee will be charged. All returns will be sent freight prepaid and properly insured by the customer. When communicating with HARRIS CORPORATION, Broadcast Systems Division, specify the HARRIS Order Number or Invoice Number.

Unpacking

Carefully unpack the equipment and preform a visual inspection to determine that no apparent damage was incurred during shipment. Retain the shipping materials until it has been determined that all received equipment is not damaged. Locate and retain all PACKING CHECK LISTs. Use the PACKING CHECK LIST to help locate and identify any components or assemblies which are removed for shipping and must be reinstalled. Also remove any shipping supports, straps, and packing materials prior to initial turn on.

Technical Assistance

HARRIS Technical and Troubleshooting assistance is available from HARRIS Field Service during normal business hours (8:00 AM - 5:00 PM Central Time). Emergency service is available 24 hours a day. Telephone 217/222-8200 to contact the Field Service Department or address correspondence to Field Service Department, HARRIS CORPORATION, Broadcast Systems Division, P.O. Box 4290, Quincy, Illinois 62305-4290, USA. Technical Support by e-mail: *tsupport@harris.com*. The HARRIS factory may also be contacted through a FAX facility (217/221-7096).

Replaceable Parts Service

Replacement parts are available 24 hours a day, seven days a week from the HARRIS Service Parts Department. Telephone 217/222-8200 to contact the service parts department or address correspondence to Service Parts Department, HARRIS CORPORATION, Broadcast Systems Division, P.O. Box 4290, Quincy, Illinois 62305-4290, USA. The HARRIS factory may also be contacted through a FAX facility (217/221-7096).

NOTE

The # symbol used in the parts list means used with (e.g. #C001 = used with C001).

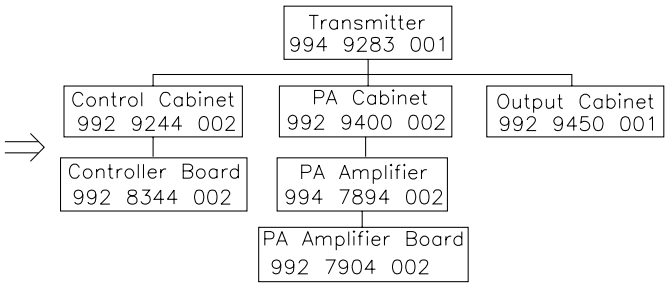
Guide to Using Harris Parts List Information

The Harris Replaceable Parts List Index portrays a tree structure with the major items being leftmost in the index. The example below shows the Transmitter as the highest item in the tree structure. If you were to look at the bill of materials table for the Transmitter you would find the Control Cabinet, the PA Cabinet, and the Output Cabinet. In the Replaceable Parts List Index the Control Cabinet, PA Cabinet, and Output Cabinet show up one indentation level below the Transmitter and implies that they are used in the Transmitter. The Controller Board is indented one level below the Control Cabinet so it will show up in the bill of material for the Control Cabinet. The tree structure of this same index is shown to the right of the table and shows indentation level versus tree structure level.

Example of Replaceable Parts List Index and equivalent tree structure:

Replaceable Parts List Index

Table 7–1.	Transmitter	994 9283 001	7–2
Table 7–2.	Control Cabinet	992 9244 002	7–3
Table 7–3.	Controller Board	992 8344 002	7–6
Table 7–4.	PA Cabinet	992 9400 002	7–7
Table 7–5.	PA Amplifier	994 7894 002	7–9
Table 7–6.	PA Amplifier Board	992 7904 002	7–10
Table 7–7.	Output Cabinet	992 9450 001	7–12



The part number of the item is shown to the right of the description as is the page in the manual where the bill for that part number starts.

Inside the actual tables, four main headings are used:

Table #-#. ITEM NAME - HARRIS PART NUMBER - this line gives the information that corresponds to the Replaceable Parts List Index entry;

HARRIS P/N column gives the ten digit Harris part number (usually in ascending order);

DESCRIPTION column gives a 25 character or less description of the part number;

REF. SYMBOLS/EXPLANATIONS column 1) gives the reference designators for the item (i.e., C001, R102, etc.) that corresponds to the number found in the schematics (C001 in a bill of material is equivalent to C1 on the schematic) or 2) gives added information or further explanation (i.e., “Used for 208V operation only,” or “Used for HT 10LS only,” etc.).

Inside the individual tables some standard conventions are used:

A # symbol in front of a component such as #C001 under the REF. SYMBOLS/EXPLANATIONS column means that this item is used on or with C001 and is not the actual part number for C001.

In the ten digit part numbers, if the last three numbers are 000, the item is a part that Harris has purchased and has not manufactured or modified. If the last three numbers are other than 000, the item is either manufactured by Harris or is purchased from a vendor and modified for use in the Harris product.

The first three digits of the ten digit part number tell which family the part number belongs to - for example, all electrolytic (can) capacitors will be in the same family (524 xxxx 000). If an electrolytic (can) capacitor is found to have a 9xx xxxx xxx part number (a number outside of the normal family of numbers), it has probably been modified in some manner at the Harris factory and will therefore show up farther down into the individual parts list (because each table is normally sorted in ascending order). Most Harris made or modified assemblies will have 9xx xxxx xxx numbers associated with them.

The term “SEE HIGHER LEVEL BILL” in the description column implies that the reference designated part number will show up in a bill that is higher in the tree structure. This is often the case for components that may be frequency determinant or voltage determinant and are called out in a higher level bill structure that is more customer dependent than the bill at a lower level.

HARRIS Broadcast Systems Division
P.O. Box 4290, QUINCY, IL 62305

PARTS ORDER FORM

HARRIS PHONE: 217-222-8200
HARRIS FAX: 217-221-7096

BILLING INFORMATION

CUSTOMER NAME: _____

ADDRESS: _____

_____

_____

_____

TELEPHONE NUMBER: _____

FAX NUMBER: _____

PREFERRED PAYMENT METHOD: _____

SHIPPING INFORMATION

SHIP TO: _____
(if different from billing information)

ADDRESS: _____

_____

_____

_____

TELEPHONE NUMBER: _____

FAX NUMBER: _____

SHIPPING METHOD PREFERRED: _____

FREQUENCY (If required): _____

EQUIPMENT NAME: _____

EQUIPMENT PART NUMBER: _____

EQUIPMENT SERIAL NUMBER: _____

GUIDE FOR ORDERING PARTS

Please use the following parts order form, filling is as much information as possible. The complete informaiton will allow double checking the part number for correctness or locating a substitude if the part is not available.
The equipment name, part number, and serial number will be found on the metal ID plate on the back of the unit. The serial number MUST be included for any parts ordered under warranty.
Describe the part using the description in the parts list if possible. Include the schematic information, schematic number, or number of next higher assembly. The next higher assembly is usually a 992-xxxx-00x type.

ITEM #	QTY ORD	HARRIS PART NUMBER	DESCRIPTION OF PART (PART'S NAME, DESCRIPTION, SPECIFICATION FROM PARTS LIST IF AVAILABLE)	SCHEMATIC REFERENCE REFERENCE NAME (e.g. C001, R100, etc)	ITEM USED ON (NEXT HIGHER ASSEMBLY IF KNOWN) (e.g. C001 used on 992 8025 001, SCHEMATIC 839 8099 991)	COMMENTS

WARNING

THE CURRENTS AND VOLTAGES IN THIS EQUIPMENT ARE DANGEROUS. PERSONNEL MUST AT ALL TIMES OBSERVE SAFETY WARNINGS, INSTRUCTIONS AND REGULATIONS.

This manual is intended as a general guide for trained and qualified personnel who are aware of the dangers inherent in handling potentially hazardous electrical/electronic circuits. It is not intended to contain a complete statement of all safety precautions which should be observed by personnel in using this or other electronic equipment.

The installation, operation, maintenance and service of this equipment involves risks both to personnel and equipment, and must be performed only by qualified personnel exercising due care. HARRIS CORPORATION shall not be responsible for injury or damage resulting from improper procedures or from the use of improperly trained or inexperienced personnel performing such tasks.

During installation and operation of this equipment, local building codes and fire protection standards must be observed. The following National Fire Protection Association (NFPA) standards are recommended as reference:

- Automatic Fire Detectors, No. 72E
- Installation, Maintenance, and Use of Portable Fire Extinguishers, No. 10
- Halogenated Fire Extinguishing Agent Systems, No. 12A

WARNING

ALWAYS DISCONNECT POWER BEFORE OPENING COVERS, DOORS, ENCLOSURES, GATES, PANELS OR SHIELDS. ALWAYS USE GROUNDING STICKS AND SHORT OUT HIGH VOLTAGE POINTS BEFORE SERVICING. NEVER MAKE INTERNAL ADJUSTMENTS, PERFORM MAINTENANCE OR SERVICE WHEN ALONE OR WHEN FATIGUED.

Do not remove, short-circuit or tamper with interlock switches on access covers, doors, enclosures, gates, panels or shields. Keep away from live circuits, know your equipment and don’t take chances.

WARNING

IN CASE OF EMERGENCY ENSURE THAT POWER HAS BEEN DISCONNECTED.

WARNING

IF OIL FILLED OR ELECTROLYTIC CAPACITORS ARE UTILIZED IN YOUR EQUIPMENT, AND IF A LEAK OR BULGE IS APPARENT ON THE CAPACITOR CASE WHEN THE UNIT IS OPENED FOR SERVICE OR MAINTENANCE, ALLOW THE UNIT TO COOL DOWN BEFORE ATTEMPTING TO REMOVE THE DEFECTIVE CAPACITOR. DO NOT ATTEMPT TO SERVICE A DEFECTIVE CAPACITOR WHILE IT IS HOT DUE TO THE POSSIBILITY OF A CASE RUPTURE AND SUBSEQUENT INJURY.

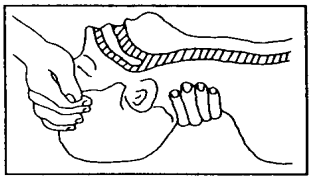
TREATMENT OF ELECTRICAL SHOCK

1. IF VICTIM IS NOT RESPONSIVE FOLLOW THE A-B-CS OF BASIC LIFE SUPPORT.

PLACE VICTIM FLAT ON HIS BACK ON A HARD SURFACE

(A) AIRWAY

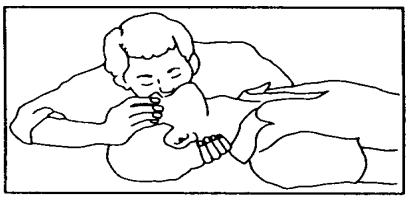
IF UNCONSCIOUS,
OPEN AIRWAY



LIFT UP NECK
PUSH FOREHEAD BACK
CLEAR OUT MOUTH IF NECESSARY
OBSERVE FOR BREATHING

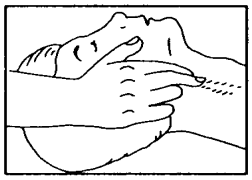
(B) BREATHING

IF NOT BREATHING,
BEGIN ARTIFICIAL BREATHING



TILT HEAD
PINCH NOSTRILS
MAKE AIRTIGHT SEAL
4 QUICK FULL BREATHS
REMEMBER MOUTH TO MOUTH
RESUSCITATION MUST BE
COMMENCED AS SOON AS POSSIBLE

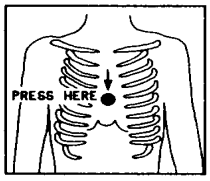
CHECK
CAROTID PULSE



IF PULSE ABSENT,
BEGIN ARTIFICIAL
CIRCULATION

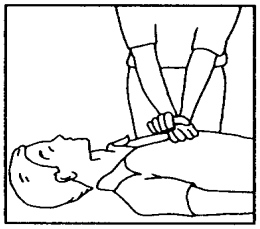
(C) CIRCULATION

DEPRESS STERNUM 1 1/2 TO 2 INCHES



APPROX. RATE OF COMPRESSIONS --80 PER MINUTE
- ONE RESCUER
- 15 COMPRESSIONS
- 2 QUICK BREATHS

APPROX. RATE OF COMPRESSIONS --60 PER MINUTE
- TWO RESCUERS
- 5 COMPRESSIONS
- 1 BREATH



NOTE: DO NOT INTERRUPT RHYTHM OF COMPRESSIONS
WHEN SECOND PERSON IS GIVING BREATH

CALL FOR MEDICAL ASSISTANCE AS SOON AS POSSIBLE.

2. IF VICTIM IS RESPONSIVE.

A. KEEP THEM WARM
B. KEEP THEM AS QUIET AS POSSIBLE
C. LOOSEN THEIR CLOTHING
D. A RECLINING POSITION IS RECOMMENDED

FIRST-AID

Personnel engaged in the installation, operation, maintenance or servicing of this equipment are urged to become familiar with first-aid theory and practices. The following information is not intended to be complete first-aid procedures, it is a brief and is only to be used as a reference. It is the duty of all personnel using the equipment to be prepared to give adequate Emergency First Aid and thereby prevent avoidable loss of life.

Treatment of Electrical Burns

1. Extensive burned and broken skin
   a. Cover area with clean sheet or cloth. (Cleanest available cloth article.)
   b. Do not break blisters, remove tissue, remove adhered particles of clothing, or apply any salve or ointment.
   c. Treat victim for shock as required.
   d. Arrange transportation to a hospital as quickly as possible.
   e. If arms or legs are affected keep them elevated.

NOTE

If medical help will not be available within an hour and the victim is conscious and not vomiting, give him a weak solution of salt and soda: 1 level teaspoonful of salt and 1/2 level teaspoonful of baking soda to each quart of water (neither hot or cold). Allow victim to sip slowly about 4 ounces (a half of glass) over a period of 15 minutes. Discontinue fluid if vomiting occurs. (Do not give alcohol.)

2. Less severe burns - (1st & 2nd degree)
   a. Apply cool (not ice cold) compresses using the cleanest available cloth article.
   b. Do not break blisters, remove tissue, remove adhered particles of clothing, or apply salve or ointment.
   c. Apply clean dry dressing if necessary.
   d. Treat victim for shock as required.
   e. Arrange transportation to a hospital as quickly as possible.
   f. If arms or legs are affected keep them elevated.

REFERENCE:

ILLINOIS HEART ASSOCIATION

AMERICAN RED CROSS STANDARD FIRST AID AND PERSONAL SAFETY MANUAL (SECOND EDITION)

Section B
Automatic Oscillator Interface (A2)

B.1 Introduction

This section covers the Automatic Oscillator Interface board. Topics include function, location, block diagram description, detailed circuit description, and troubleshooting.

Assembly #	992-8195-002
PWB #	843-5155-013
Schematic #	839-7930-025

NOTE: Maintenance/Alignments for this board are covered in Section V; and Parts List in Table B-1.

B.2 Function

The Automatic Oscillator Interface board contains circuits for selecting Oscillator A or optional Oscillator B, and active Oscillator fault sensing. The RF output of this board goes to the Buffer Amplifier via the Driver Combiner Motherboard.

B.3 Location

The Oscillator Interface board is mounted in the RPAC on the left sidewall. (See VIEW 2)

B.4 Block Diagram Description

B.4.1 Oscillator Switching

Normally, Oscillator A is selected for operation. Optional Oscillator B, if installed, can be selected by switching the relay to the opposite position manually or automatically.

B.4.2 Fault Sensing

Fault sensing for the active Oscillator is accomplished by applying the RF Present output from the Oscillator to a comparator. If the Oscillator output is not present, the comparator sends an Oscillator Fault to the Controller board. The inactive oscillator RF Present output is inhibited from causing an Oscillator fault.

B.4.3 Auto Switching Theory

Auto Switching for the active Oscillator is accomplished by applying the RF Present output from the Oscillator to a comparator. If the Oscillator output is not present, the comparator signals a PNP transistor “ON” and command the RELAY to Activate Oscillator Board “B”. This Transistor enables the Relay and the RF Output form Oscillator Board “B” is then routed to the Output of the Automatic Oscillator Interface.

During this switch the Transmitter will shut down (IF “ON”) with a LOW DRIVE fault. When the Transmitter turns back “ON” Oscillator “B” will be enabled. A “LOW DRIVE” and OSCILLATOR FAULT will show up on the Front Panel of the Transmitter.

When the signal from Oscillator Board “A” returns the comparator signals a PNP transistor “OFF”and command the RELAY to Activate Oscillator Board “A”.

During this switch the Transmitter will shut down with a LOW DRIVE fault. When the Transmitter turns back “ON”, Oscillator “A” will be enabled. A “LOW DRIVE” will show up on the Front Panel of the Transmitter. An Oscillator Fault will not show up on the Front Panel of the Transmitter.

B.4.4 Power Supplies

+22/18Vdc (DX100/DX200) is regulated down to +15Vdc and +5Vdc to power circuits on the board.

B.5 Detailed Circuit Description

Refer to the schematic diagram for the Oscillator Interface board (839-7930-025) for all descriptions in this section.

B.5.1 Power Supply Switching

Relay K1 and Oscillator Select switch S2 are shown in the normal Oscillator A selected position. +22/+18Vdc and -22/-18Vdc are connected to Oscillator A at J2. Indicator DS3, Oscillator A Selected, is connected to the +22/+18Vdc supply and will be

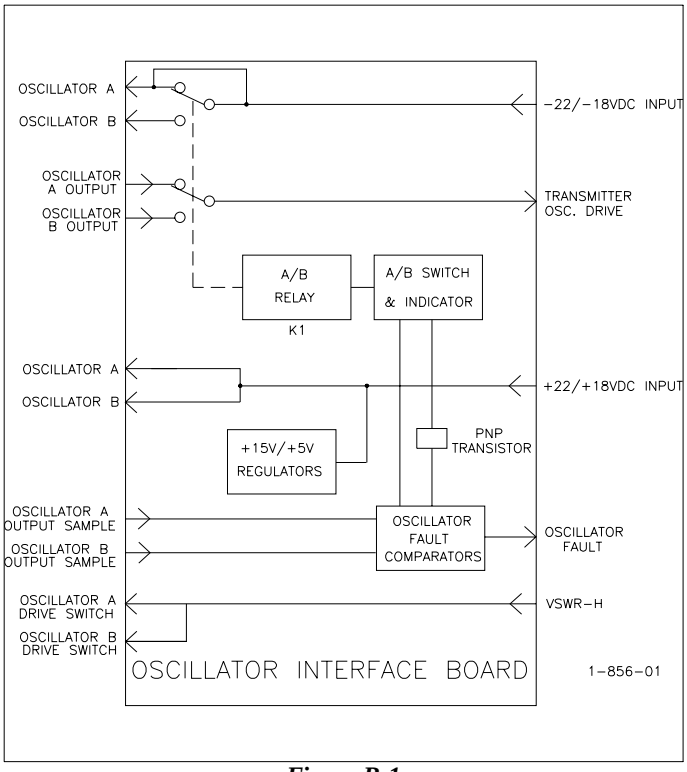


Figure B-1
Oscillator Interface Block Diagram

WARNING: Disconnect primary power prior to servicing.

illuminated green. When K1 is energized, the supplies are connected to Oscillator B at J9 and DS4, Oscillator B Selected, will illuminate.

Crystal Heater Select jumpers P1 and P2 are connected 1-2 so that the inactive Oscillator board has -22/-18Vdc to keep the crystals heaters active.

B.5.2 Oscillator Output Switching

Transmitter Drive Out (From Oscillator A) enters at J3-1 and passes through the K1 contacts 3 and 11 to TP5 Oscillator Out and J7-1. Transmitter Oscillator Drive at J7-1 then connects to the Driver Combiner Motherboard and eventually to the Buffer Amplifier.

If selected, Transmitter Drive Out (From Oscillator B), enters at J8-1 and passes through the K1 contacts 7 and 11 to TP5 and J7-1.

Zener diodes CR1 and CR6 (when used in a DX200, CR6 is replaced with a jumper) are connected to the +22/+18Vdc, and are in series with the relay coil. This drops the +22/+18Vdc to +12Vdc for the relay coil at pin 13. If the Oscillator Select switch, S1, is in the B position, a ground is applied to the relay coil at pin 14 and the relay energizes.

B.5.3 Fault Sensing Auto Switching Comparators

Normally, when Oscillator A is operating, the RF(-) input at J12-3 is -.6Vdc and RF(+) input at J12-1 is +3.5Vdc, and comparator U2-2 output at TP11 is +15Vdc. Should Oscillator A fail, the RF(-) voltage will be greater than the RF(+) voltage and TP11 will go to 0Vdc. This signal then Turns "ON" Q1 (PNP) Transistor. When Q1 is turned "ON" the Relay is enabled and the RF outputs and Fault sensing will then be dedicated to Oscillator Board "B". The voltage at U2-9 will be 2.6Vdc, established by a resistor divider, R8 and R10.This fault will only be visible for time it takes to switch to Board "B".

When Oscillator B is selected, the same voltages are supplied to J10-3 and J10-1, and the output of U2-1 at TP12 is +5Vdc. If a failure occurs, the voltage at U2-11 will be 2.6Vdc.

B.5.4 Fault Sensing Selection

B.5.4.1 Oscillator A Selected

K1 is de-energized and approximately +10Vdc is supplied to U2-8 through the relay coil. Normally U2-9 is +15Vdc and the output of U2-14 at TP6 Oscillator Fault is +5Vdc. When TP11 goes low and U2-9 goes to +2.6Vdc, the output of U2-14 goes LOW and TP6 is 0Vdc. An Oscillator Fault-L is generated and sent to the Controller via the Transmitter Interface.

Diode CR8 pulls up U2-11 to the +10Vdc supply, so a fault is not generated by U2-13 (Oscillator B Fault).

B.5.4.2 Oscillator B Selected

K1 is energized and 0Vdc is applied to U2-8 to prevent U2-14 (Oscillator A Fault) from going low. Diode CR8 is reversed biased, and the voltage at U2-10 is set at +4.6Vdc by R13 and R8. Should Oscillator B fail, U2-11 goes to +2.6Vdc and U2-13 goes LOW, generating an Oscillator Fault-L to the Controller via the Transmitter Interface.

B.5.5 Power Supplies

+22/+18Vdc passes through F1 and is regulated down to +15Vdc by U4. U3 is connected to the +15Vdc and forms a +5Vdc supply. Indicators DS2 and DS1 illuminate green when the respective supplies are operational.

B.5.6 VSWR Control Line

When the Controller generates a VSWR-H signal, +5Vdc appears at J5-1 and TP16 for 250nS. This voltage is distributed to Oscillator A at J12-5 and optional Oscillator B at J10-5.

B.6 Oscillator Interface Troubleshooting

Any Problems on these board can be classified into three areas. These are:

a. Power Supply
b. Signal Switching, and
c. Fault Sensing.

Refer to the Oscillator Interface Schematic (839-7930-013) as needed for this section. Troubleshooting the circuitry associated with the combined transmitter mode is covered in the combined transmitter manual.

B.6.1 Power Supply

Begin troubleshooting by:

a. Checking that the +15V (DS2) and +5v (DS1) LED's are lit with the low voltage on only.
b. If DS1 is out but DS2 is lit:
   1. Check TP1 for +5Vdc.
   2. If not present, check U3, and associated circuitry.
c. If both indicators are out:

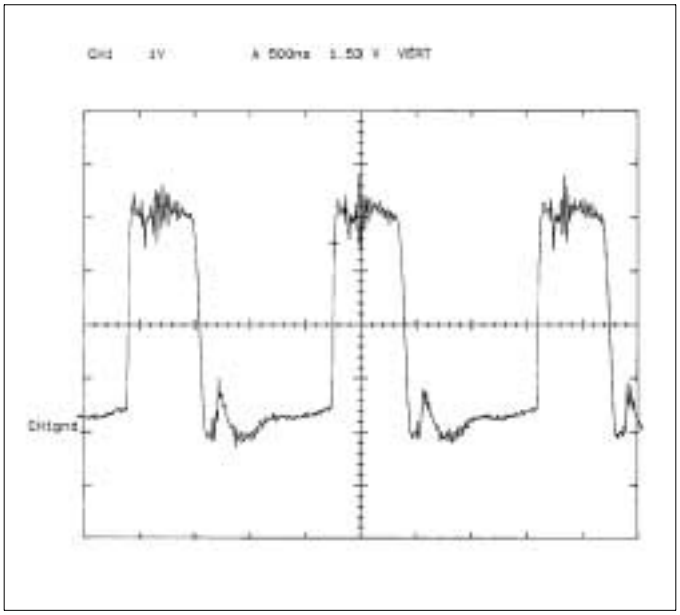


Figure B-2
TP5 Waveform

WARNING: Disconnect primary power prior to servicing.

1. Check F1, and replace if open.
2. If F1 is not open, then check for +22/+18Vdc on J1-1 and -22/-18Vdc on J1-3.
3. If not present, refer to the Transmitter Troubleshooting section to troubleshoot the Low Voltage Supply.
4. If +22/+18Vdc is present, check TP2 for +15Vdc.
5. If not present, check U4 and associated circuitry.

After repairs are made to the Power Supply, check the output of the supplies to ground with an ohmmeter for shorts before applying power to the board.

B.6.2 Signal Switching

If the transmitter will not switch between Oscillator A and Oscillator B and/or there is no signal at TP5 (Osc Out), the Oscillator Select Circuit may have failed.

a. Toggle the Osc Select Switch (S2).
   1. The Osc Selected indicator (DS3 or DS4) should light and extinguish as the switch is activated and relay K1 should change states.
   2. If no indicator lights and K1 does not change states, then check TP3 for +22/+18Vdc and TP4 for -22/-18Vdc.
   3. If not present, refer to the Transmitter troubleshooting section for troubleshooting the Low Voltage Supplies.

b. If the indicators switch and K1 changes state but there is no signal at TP5, check for the presence of RF at the contacts of K1. Pins 3 and 7 are the input to the relay and pin 11 is the output.
   1. If there is no input check the connector associated with the selected oscillator for a signal.
   2. If not present, refer to the trouble shooting section of the Oscillator and/or check cable for an open or short.

c. If the input is present, but there is no output at pin 12, disconnect J7 on the board.
   1. If the signal returns, refer to the troubleshooting section of the Driver Combiner and/or check the cable for a short.
   2. If the signal is still not present, replace K1.

d. If DS3 indicator remains on and K1 does not change states when S2 is toggled, check the cathode of CR2 for +12Vdc.
   1. If not present, check CR1, CR6 and F1.
   2. If the +12Vdc is present, check for +8 volt on the anode of CR2 when Oscillator A is selected and 0Vdc volts when Oscillator B is selected.
   3. If the voltage changes but no action is seen on K1 or the LED's fail to switch, replace K1.
   4. If voltage on the anode of CR2 does not change from +8 volts, verify low resistance to ground when S2 is in the B position.
   5. If no change is seen in resistance, replace S2.

e. If DS4 is lit and the voltage at the anode of CR2 remains at 0Vdc, verify that the Osc B Select line from the Transmitter Interface board is not active (High), to be sure it is the local control causing K1 to activate not a remote control input.
   1. If active, refer to the Transmitter Interface section of the manual.
   2. If not active, check U1 and/or CR3.

B.6.3 Fault Sensing

Begin Troubleshooting as follows:

a. Check the state of TP6 (Osc Fault).
   1. If this is logic high, the transmitter should not display a fault on the ColorStat™ Front Panel.
   2. If a fault is displayed, refer to the Controller section of the manual for further troubleshooting.

b. If this line is a logic low, select Osc B (if equipped) on S2.
   1. Verify that DS4 lights indicating that Osc B is selected.
   2. If not, refer to Signal Switching Section of this procedure.

c. After selecting Oscillator B, check TP6 for a logic high.
   1. If present, troubleshoot Oscillator A sensing circuit.
   2. If there is no change, troubleshoot Oscillator B sensing circuit.
   3. If the transmitter is not equipped with Oscillator B troubleshoot Oscillator A sensing.

B.6.4 Oscillator A Sensing

a. Check the voltage on TP11 for a logic high.
   1. If the high is present, unplug J12 and monitor TP11, the voltage should go to a logic low.
   2. If not, change U2.

b. If the high is not present on TP11, check the input to U2-4. It should be approximately -0.6Vdc.
   1. Check the input to U2-5 it should be approximately +3.5Vdc.
   2. If these are not correct, refer to the Oscillator Section for Troubleshooting the Oscillator sample lines. Also check the cabling for opens or shorts.

c. If the inputs to U2 are correct, replace U2.

d. If TP11 changes states when J12 is unplugged, check the inputs to U2-9 and U2-8.
   1. U2-8 should be approximately 2.6Vdc and U2-9 should be the logic high presented at TP11.
   2. If U2-8 is greater than 2.6Vdc check CR3 and U2.
   3. If U2-8 is zero or low check CR3, U2, R8, and U1.

B.6.5 Oscillator B Sensing

a. Check the voltage on TP12 for a logic high.
   1. If the high is present, unplug J10 and monitor TP12, the voltage should go to a logic low.
   2. If not, change U2 and/or check CR8.

b. If the high is not present on TP12, check the input to U2-6. It should be approximately -.6Vdc.
   1. Check the input to U2-7 it should be approximately +3.5Vdc.

WARNING: Disconnect primary power prior to servicing.

2. If these are not correct refer to the Oscillator Section for Troubleshooting the Oscillator sample lines. Also check the cabling for an open or short.

c. If the inputs to U2 are correct, replace U2.

1. If TP12 changes states when J10 is unplugged, check the inputs at U2-10 and U2-11.
2. U2-10 should be approximately 2.6Vdc and U2-11 should be the high presented at TP12.
3. If U2-10 is greater than 2.6Vdc check the voltage divider (R13 and R8) and U2.
4. If U2-10 is zero or low check, U2, C18, and R13.

WARNING: Disconnect primary power prior to servicing.

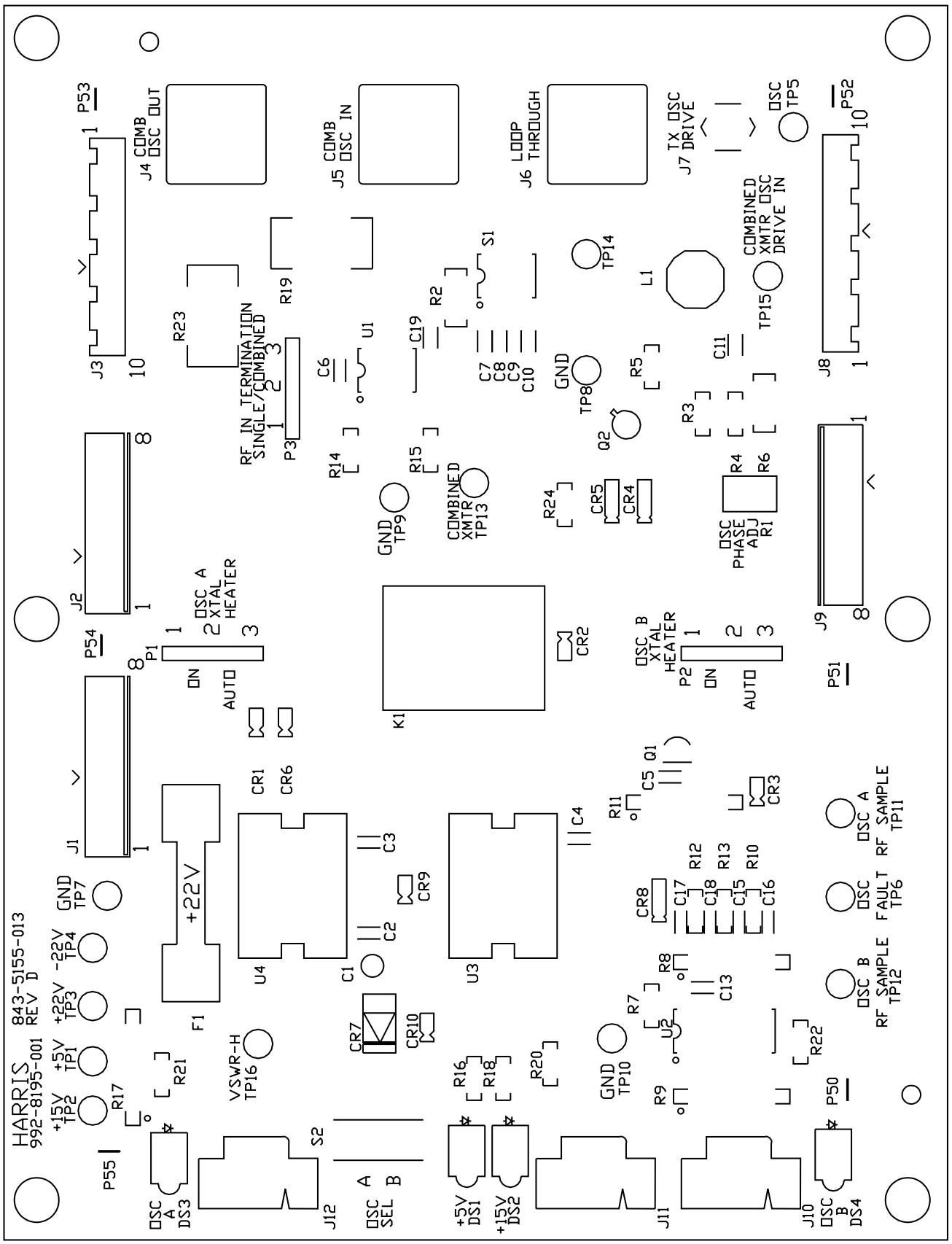


Figure B-3
Oscillator Interfafce Component Locator

WARNING: Disconnect primary power prior to servicing.

Table B-1 OSC INTERFACE BD - 992 8195 002 (mod.)

HARRIS PN	Description	Qty/UM		Reference Designators
300 1486 000	“SCR, 4-40 X 3/8"	2	EA	1/U003 1/U004
304 0087 000	“NUT, HEX 4-40"	2	EA	1/U003 1/U004
308 0003 000	NO 4 FLAT WASHER BRS	2	EA	1/U003 1/U004
312 0045 000	“WASHER, SPLIT-LOCK 4"	2	EA	1/U003 1/U004
354 0309 000	TERM SOLDER	1	EA	“TP001,TP002,TP003,TP004,TP005,TP006,TP007,TP008, TP009,TP010,TP011,TP012,TP013,TP014,TP015,TP016"
358 1726 000	“SPRING, HOLD DOWN”	1	EA	#K001
358 1928 000	JUMPER 1/4 LG 1/8H	1	EA	P054
380 0083 000	“XSTR, 2N2369 ESD”	1	EA	Q002
380 0126 000	“XSTR, PNP 2N4403 ESD”	1	EA	Q001 INSTALL 2N4403 BACKWARD FROM SILK-SCREEN
382 0184 000	“IC, 340T-5/7805 +5V REG ESD”	1	EA	U003
382 0359 000	“IC, 7815 ESD”	1	EA	U004
382 1084 000	“IC, LP339N ESD”	1	EA	U002
382 1204 000	IC TC4423 ESD	1	EA	U001
384 0321 000	*DIODE 5082-2800 ESD	2	EA	“CR004,CR005"
384 0431 000	RECT. 1N4001 ESD	3	EA	“CR002,CR009,CR010"
384 0612 000	DIODE 1N3070 ESD	1	EA	CR008
384 0661 000	“LED, GRN, T 1-3/4, RT ANG ESD”	4	EA	“DS001,DS002,DS003,DS004"
384 0720 000	TRANSZORB 1N6377 15V 5W ESD	1	EA	CR007
386 0082 000	“ZENER, 1N4744A 15V 1W 5% ESD”	1	EA	CR003
386 0135 000	“ZENER, 1N4733A 5.1V ESD”	2	EA	“CR001,CR006"
398 0015 000	“FUSE,FAST CART .500A 250V”	1	EA	F001
402 0129 000	“CLIP, 1/4 DIA FUSE”	2	EA	XF001
404 0161 000	SOCKET RELAY 9KH2	1	EA	XK001
404 0513 000	HEAT SINK PA1-1CB	2	EA	“#U003,#U004"
404 0673 000	“SOCKET, DIP, 8 PIN (DL)”	1	EA	XU001
404 0674 000	“SOCKET, DIP, 14 PIN (DL)”	1	EA	XU002
492 0750 000	COIL ADJ RF 1.65-2.75 UH	1	EA	L001
506 0232 000	“CAP, 0.01UF 100V 5%”	2	EA	“C009,C011"
506 0233 000	“CAP, 0.1UF 63V 5%”	1	EA	C019
506 0236 000	“CAP, 0.0047UF 100V 5%”	1	EA	C007
506 0237 000	“CAP, 0.0068UF 100V 5%”	1	EA	C008
506 0238 000	“CAP, 0.015UF 100V 5%”	1	EA	C010
516 0453 000	CAP .1UF 100V 20% X7R	7	EA	“C002,C003,C004,C005,C006,C013,C018"
516 0530 000	CAP .01UF 10% 100V X7R	3	EA	“C015,C016,C017"
522 0548 000	CAP 10UF 50V 20%	1	EA	C001
540 0563 000	*RES 10 OHM 2W 10%	1	EA	R019
540 1380 000	RES NETWORK 10K OHM 2%	4	EA	“R008,R009,R011,R017"
546 0295 000	RES 50 OHM 3.25W 5%	1	EA	R023
548 2400 169	RES 51.1 OHM 1/2W 1%	1	EA	R006
548 2400 201	RES 100 OHM 1/2W 1%	1	EA	R002
548 2400 242	RES 267 OHM 1/2W 1%	1	EA	R003
548 2400 251	RES 332 OHM 1/2W 1%	1	EA	R016
548 2400 269	RES 511 OHM 1/2W 1%	1	EA	R004
548 2400 285	RES 750 OHM 1/2W 1%	1	EA	R005
548 2400 301	RES 1K OHM 1/2W 1%	3	EA	“R007,R014,R015"
548 2400 318	RES 1.5K OHM 1/2W 1%	1	EA	R018
548 2400 334	RES 2.21K OHM 1/2W 1%	2	EA	“R021,R022"
548 2400 401	RES 10K OHM 1/2W 1%	1	EA	R020
548 2400 434	RES 22.1K OHM 1/2W 1%	2	EA	“R013,R024"
548 2400 466	RES 47.5K OHM 1/2W 1%	2	EA	“R010,R012"

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548 2400 601	RES 1MEG OHM 1/2W 1%	1	EA	R100 ADD FROM U2 PIN 4 TO +5VDC
550 0947 000	TRIMPOT 1K OHM 1/2W 10%.	1	EA	R001
574 0156 000	RELAY 12VDC 4PDT	1	EA	K001
604 0852 000	“SW, RKR DIP 4-SPST”	1	EA	S001
604 1089 000	“SW, TGL SPDT PC MOUNT”	1	EA	S002
610 0679 000	“PLUG, SHORTING, .25"” CTRS"	3	EA	“P001,P002,P003"
610 0978 000	*HDR 10C RT ANG 2ROW TOP LATCH.	3	EA	“J010,J011,J012"
610 0999 000	“HDR, 10 PIN, PC BD”	2	EA	“J003,J008"
610 1106 000	“HDR, 8PIN, 1ROW, STRT,POL”	3	EA	“J001,J002,J009"
612 0904 000	“JACK, PC MT GOLD PLATED”.	9	EA	“XP001,XP002,XP003"
620 0515 000	“RECP, SCREW ON SMC”.	1	EA	J007
620 1677 000	“RECEPTACLE, PC MT, BNC”.	3	EA	“J004,J005,J006"
839 7930 025	“SCHEM, OSC INTERFACE”	0.0		
843 5155 013	“PWB, OSC INTERFACE”	1		

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