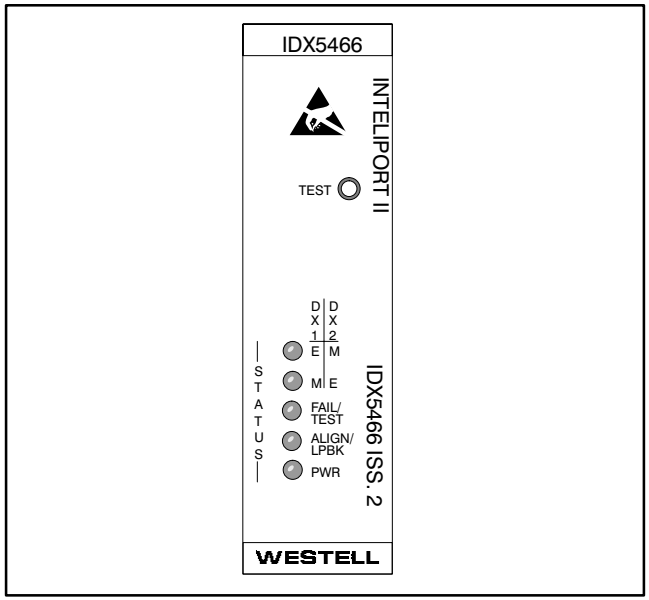

Figure 1. Front View of IDX5466 Issue 2

1. GENERAL

1.1 Document Purpose

This document facilitates the installation of the Westell IDX5466 (Issue 2), shown in Figure 1. See Westell's practice number 030-101501 for additional and more detailed equipment information.

1.2 Document Status

This Installation Guide replaces Installation Guide number 055-000036.

1.3 Product Purpose

The IDX5466 provides an interface between a 4W facility employing DX signaling and a 2W or 4W E&M trunk circuit. As a member of Westell's family of Intelligent Network Channel Terminating Equipment (INCTE), the IDX5466 performs all the functions of a standard DX unit while providing remote or automatic alignment capability (gain, equalization, and DX balancing) when accessed from a Serving Test Center (STC). INTELIPORT II contains an integral microprocessor that controls all internal functions of the unit and a precision oscillator circuit that generates the required test tones during maintenance and alignment routines. Upon completing testing and alignment functions, INTELIPORT II automatically calculates the amount of gain and equalization required for proper level coordination between the facility and equipment. Micro-processor-controlled pulse correctors automatically compensate for distortions introduced by the facility and/or trunk equipment.

1.4 Product Mounting Location

The IDX5466 is typically mounted in in a 400-type (or 550-type) shelf or mounting assembly. Power required for operation is -42 to -56 Vdc at 35 mA minimum during idle; 45 mA, maximum during testing and alignment.

2. INSTALLATION

The IDX5466 should be installed according to local company practices; however, if none exist, the unit may be installed as described below.

1. **Follow ESD and safety Precautions.** Use/observe proper Electro-Static Discharge and safety precautions and procedures whenever handling and installing the unit. See cautions on next page.
2. **Unpack and Inspect.** Gently unpack the IDX5466 and visually inspect it for damage (report damages to the shipping company and to Westell).

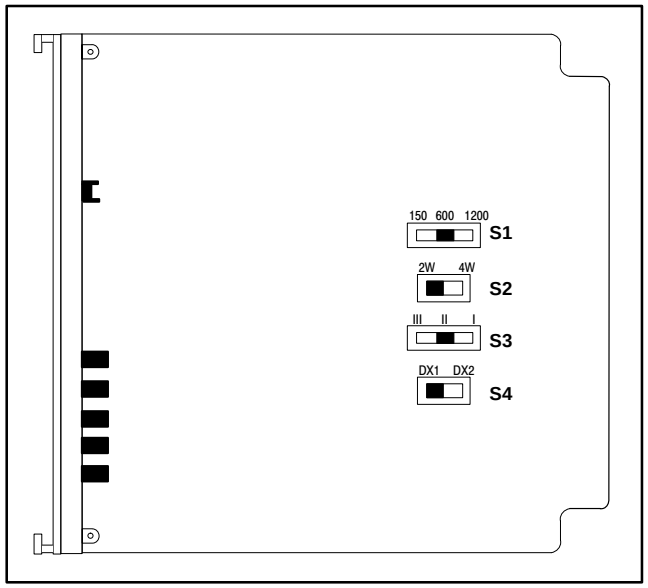

Figure 2. Option Locations on Side Panel PCB

3. **Set Options.** Set all hard switch options prior to inserting the IDX5466 in the mounting shelf/assembly. Option the unit per local company practice (consult WORD or CLR card) or see Table 2 and Figure 2 for option descriptions.
4. **Mount Unit.** After setting all the switches to the correct/applicable positions, insert the unit into its proper slot in the assembly.
5. **Perform Installer Connections.**
   No installer connections are required for the unit other than inserting the module into the card-edge connector in the shelf or assembly. IDX5466 pin-outs are shown in Table 3.
6. **Verify Power.** Apply and verify the presence of power at the front panel (see Table 1).
7. **Perform Testing.** Perform testing per local company practice, or per the procedures outlined in Part 3. If testing is not done immediately upon installation, the span can be turned over to the test person at the test center or at the CPE for testing, after inserting each unit into position and verifying the LED status.
8. Repeat steps 1 - 7 for each unit installed.

LED	On	Off	Flashing
PWR	Power is applied	Power is not applied	NA
Align/ LPBK	Command or Alignment Mode	Idle	Loopback Mode
Fail/Test	Logic Failure	Idle	Test Mode
E	E-lead Busy	Idle	NA
M	M-lead Busy	Idle	NA

Table 1. LED Status

Option	Position	Function/Description
S1	150	Select when interfacing long nonloaded cable (typically more than 3dB of loss)
	600	Select when interfacing short nonloaded cable (typically less than 3dB of loss)
	1200	Select when interfacing loaded cable
S2	2W	Select when interfacing 2W E&M equipment/data modem
	4W	Select when interfacing 4W E&M equipment/data modem
S3	I	Select for Type I E&M signaling
	II	Select for Type II E&M signaling
	III	Select for Type III E&M signaling
S4	DX1	Select for DX1 operation
	DX2	Select for DX2 operation

Table 2. Option Switch Positions

DESIGNATION		PIN
RT - 4W RCV IN Tip	FACILITY	7
RR - 4W RCV IN Ring		13
TT - 4W XMT OUT Tip		41
TR - 4W XMT OUT Ring		47
T1 - 4W RCV OUT Tip	EQUIP.	5
R1 - 4W RCV OUT Ring		15
T - XMT IN/2W Tip		55
R - XMT IN/2W Ring		49
E-Lead	MISC.	23
M-Lead		21
SB - Signal Battery		1
SG - Signal Ground		19
MNLB - Manual Loopback		2
PWR - Power		35
GND - Ground		17

Table 3. Pin Designations

- CAUTION -

Never apply power until all installer connections are made.

- PRECAUTIONARY STATEMENT -

Never install telephone wiring during a lightning storm.

Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.

Never touch uninsulated telephone wires/terminals unless the telephone line is disconnected at the network interface.

Use caution when installing or modifying telephone lines.

CAUTION - STATIC-SENSITIVE

This product contains static-sensitive components! Proper electrostatic discharge procedures must be followed to maintain personal and equipment safety. Do not store near magnetic, electromagnetic or electrostatic fields. Always store or ship units in the original static-protective packaging.

- CAUTION -

Use care when installing and removing modules - *do not force into place*. If a module resists insertion, remove it, check for debris in or near the connectors and mounting slots, then gently re-insert the module.

3. TESTING & TROUBLESHOOTING

After installation is complete, testing consists of following the steps in Table 7. Further testing details are provided in practice 030-101501.

This unit should not be field repaired. If trouble is encountered, verify all installer connections to the shelf and verify the CO power fuse is not blown. Verify all module connections and switch settings, and that units are making a positive connection with the shelf connector. If trouble persists, replace the suspect unit with another optioned identically, and retest. If the replaced unit operates correctly, the original may be faulty and should be returned for repair or replacement. Repairs made beyond replacing a faulty unit are not recommended and may void the warranty.

4. TECHNICAL & CUSTOMER SERVICE

If technical or customer assistance is required, contact Westell by calling or using one of the following options:

Voice: (630) 898-2500
Voice: (800) 323-6883
email: *global_support@westell.com*
Internet: http://**www.Westell.com**

This equipment is identified by a model, part, and an issue number. Each time a product change is made that changes the form, fit or function of the product, the issue number is advanced by one. Please indicate the part number shown in Table 4 when making product inquiries.

Model #	Part #	Description
IDX5466	5466I2	INTELIPORT® II IDX5466 Issue 2 2W/4W Interface. CLEI* Code: DXIUBAA1AA. Barcode: 655264.

** CLEI is a trademark of Telcordia Technologies.*

Table 4. Ordering Information

Physical Feature	U.S.	Metric
Height	5.6 inches	14.2 cm
Width	1.4 inches	3.6 cm
Depth	5.9 inches	15 cm
Weight (approx.)	16 ounces	.45 Kg
Operating Temp.	32° to 122°F	0° to 50°C
Humidity	0 to 95% (non-condensing)	

Table 5. Physical Specifications

Function	Normal Mode	Terminal Mode
Command Mode	Interrupted 404Hz	Steady 404Hz
Accept Tone	Burst of 2804Hz (Beep)	Steady 1004Hz
Reject Tone	Alternating 404/1004Hz	Steady 2804Hz

Table 6. Acknowledgement Tones

Step	**Installer Task/Action (bold) /** Result/Response/Comments (roman)
1.	**Perform installation steps per Part 2 (set options, mount unit, apply power).**
2.	**Press front panel TEST swtich (less than 5 seconds) to initiate Wire Test Mode to verify installation.**
3.	**Connect suitable listening device to:** 4W Applications / 2W Applications Facility-side RCV IN pair: Verify continuous 1004Hz / Verify continuous 1004Hz Facility-side XMT OUT pair: Verify interrupted 1004Hz / Verify interrupted 1004Hz Demarc-side RCV OUT pair: Verify continuous 1004Hz Demarc-side XMT IN pair: Verify interrupted 1004Hz / Verify interrupted 1004Hz *Note: In 2W applications, the RCV OUT and XMT IN ports utilize the same transmission pairs (T&R, pins 55 and 49).* **Upon completion, disconnect test equipment and press the TEST switch a second time to end the Wire Test Mode.** *Note: If switch is not pressed a second time, the Wire Test Mode automatically times out after one hour.*
Tester's Procedures	
4.	**Send 2713Hz via INTELIPORT's RCV IN port (pins 7 and 13) for greater than 30 seconds.** If tone is removed in less than 30 seconds, INTELIPORT enters loopback.
5.	**Verify interrupted 404Hz* via INTELIPORT's XMT OUT port (pins 41 and 47).** Command Mode initiated. **Note: If test center does not have audible monitoring capability, enter DTMF command "86" (Terminal Mode). This action causes INTELIPORT's normal response tones to change to steady tones. When "86" is entered, the interrupted 404Hz command mode tone changes to steady 404Hz.*
6.	**Remove 2713 Hz.**
7.	**Setting Levels.**

	Normal Mode	Terminal Mode
	Set RCV OUT Level	***Set RCV OUT Level***
	Enter DTMF command "#1". INTELIPORT returns "beep". **Enter level desired.** INTELIPORT returns "beep", then returns to command mode.	**Enter DTMF command "#1", followed by desired level.** INTELIPORT returns 60 seconds of 1004Hz, then returns to command mode.
	Set XMT IN Level	***Set XMT IN Level***
	Enter DTMF command "#2". INTELIPORT returns "beep". **Enter level desired.** INTELIPORT returns "beep", then returns to command mode.	**Enter DTMF command "#2", followed by desired level.** INTELIPORT returns 60 seconds of 1004Hz, then returns to command mode.
	Set XMT OUT Level	***Set XMT OUT Level***
	Enter DTMF command "#3". INTELIPORT returns "beep". **Enter level 000.** INTELIPORT returns "beep", then returns to command mode.	**Enter DTMF command "#2", followed by level 000.** INTELIPORT returns 60 seconds of 1004Hz, then returns to command mode.

Table 7 - Continued on next column...

Step	Installer Task/Action (bold) / Result/Response/Comments (roman)
8.	**Remote Alignment.** **From Command Mode, enter DTMF command "#4".** INTELIPORT returns 1004Hz. **Record level in correct column B space, then send 1004 Hz to INTELIPORT.** INTELIPORT returns 2804Hz. **Record level in correct column B space, then send 2804 Hz to INTELIPORT.** INTELIPORT returns 404Hz. **Record level in correct column B space, then send 404 Hz to INTELIPORT.** INTELIPORT returns 1804Hz. **Record level in correct column B space, then send 1804 Hz to INTELIPORT or ignore tone.** INTELIPORT aligns to either the 3 or 4 tones accordingly, returns either a ramp-up tone (indicating a good alignment) or a ramp-down tone (indicating correct alignment could not be achieved), then returns to command mode.
9.	**Loopback (Customer's RCV Level).** **From Command Mode, enter DTMF command "#6".** **While in loopback, send tones to INTELIPORT, one at a time.** **Record level of each tone as it is returned in the correct column C space.** **Upon completion, enter DTMF command "#".** INTELIPORT returns to command mode.
	OPTIONAL TESTS - QUIET TERM/TRANSPONDER **From Command Mode, enter DTMF command "#5".** INTELIPORT applies a quiet termination over XMT IN port and sets 20-min. Timer circuit. *Note: Quiet Termination remains in effect for 20 minutes. If no tone is sent to INTELIPORT during the 20-minute time frame, INTELIPORT times out and returns to command mode. If release from the Quiet Term/Transponder mode is desired before the 20 minute time frame,* ***enter DTMF command "#"****. INTELIPORT returns to command mode.* **Test person performs noise measurements.** From quiet termination mode, test person can perform Steps 10 thru 13.
10.	**Activate 4-Tone Auto-Sweep Transponder Mode.** **During quiet termination, enter DTMF command "4*".** INTELIPORT sweeps 404Hz, 1004Hz, 1804Hz, and 2804Hz, each for 15 seconds, then re-applies quiet termination.
11.	**Activate Full-Range Transponder Mode.** **During quiet termination, enter any 2-digit code as follows:** **"03" thru "32" (except "27").** INTELIPORT returns appropriate tone corresponding to code received (example: Code "03" represents 304Hz, Code "10" represents 1004Hz, Code "28" represents 2804Hz; etc.)
12.	**Activate Level Verification Test.** **During quiet termination, enter one of the following DTMF commands**: **"*0"** This command establishes a 1004Hz reference level at the XMT OUT port - Verify. **"*1"** This command allows test person to verify RCV OUT level. **"*2"** This command allows test person to verify XMT IN level. **"*3"** This command allows test person to verify XMT OUT level.

Table 7 - Continued on next column...

Step	Installer Task/Action (bold) / Result/Response/Comments (roman)
13.	**Activate Unit for THL Measurement Test.** **During quiet termination, enter one of the following DTMF commands**: **"1*"** This command allows unit to set up the THL reference mark and applies a short across the 2W port - Verify. **"2*"** This command causes unit to replace the short with a 600-ohm, 2.15uF termination - Tester performs THL measurement. **"3*"** This command causes unit to reconnect the 2W port to the equipment - Tester performs THL measurement. **Upon completion or to release from any mode, enter DTMF command "#".** INTELIPORT returns to command mode.
14.	**Equal-Level Loopback.** **From Command Mode, enter DTMF command "#0".** **While in loopback, send tones to INTELIPORT, one at a time.** **Record level of each tone as it is returned in correct column C space.** **Upon completion, enter DTMF command "#"** (INTELIPORT returns to command mode) **or send 2713Hz for 5 seconds minimum** (INTELIPORT returns to idle). *Note: Loopback automatically releases after 20 minutes.*
15.	**Signaling Test Mode.** **From Command Mode, enter DTMF command "#7". Test person can then enter one of the following DTMF Digits:** **"1"** This command causes INTELIPORT to initiate a DX Off-hook condition (simulates a DX Busy condition) and apply a short across the 2W port. **"2"** This command causes INTELIPORT to initiate a DX On-hook condition (simulates a DX Idle condition) and replaces the short with a 600-ohm, 2.15uF termination. **"3"** This command causes INTELIPORT to send DX Pulses (10PPS at 58% Break) to the distant end. **"4"** This command causes INTELIPORT to reconnect the 2W port. Allows test person to perform THL measurements. **Upon completion, enter DTMF command "#".** INTELIPORT returns to command mode.
16.	**DX NORM/REV - Toggle (Circuit is initially set for NORM).** **From Command Mode, enter DTMF command "#8". Test person can then enter one of the following DTMF Digits:** **"1"** This command causes INTELIPORT to toggle to the NORM position. **"2"** This command causes INTELIPORT to toggle to the REV position. **Upon completion, enter DTMF command "#".** INTELIPORT returns to command mode.
17.	**Release.** **Upon completion, enter DTMF command "##".** INTELIPORT returns to Idle.
18.	**Perform calculation for Column D in Table 8 below.** Comumn D equals Customer's RCV OUT Level.

Note: The above procedures may also be performed using frequencies (see IDX5466 practice number 030-101501).

Table 7. Test Procedures

A	B	C	D
FREQUENCY	ALIGNMENT LEVELS	LOOPBACK LEVELS	C MINUS B
1004Hz			
2804Hz			
404Hz			
1804Hz			

Table 8. IDX5466 (Issue 2) Quick Alignment

ENTER CODE	OR	SEND FREQUENCY	INTELIPORT RETURNS
03		304Hz	301Hz
04		404Hz	401Hz
05		504Hz	502Hz
06		604Hz	605Hz
07		704Hz	706Hz
08		804Hz	806Hz
09		904Hz	903Hz
10		1004Hz	1011Hz
11		1104Hz	1110Hz
12		1204Hz	1210Hz
13		1304Hz	1303Hz
14		1404Hz	1411Hz
15		1504Hz	1505Hz
16		1604Hz	1612Hz
17		1704Hz	1693Hz
18		1804Hz	1782Hz
19		1904Hz	1881Hz
20		2004Hz	1992Hz
21		2104Hz	2117Hz
22		2204Hz	2185Hz
23		2304Hz	2335Hz
24		2404Hz	2419Hz
25		2504Hz	2509Hz
26		2604Hz	2605Hz
27*		NA**	NA
28		2804Hz	2822Hz
29		2904Hz	2945Hz
30		3004Hz	3079Hz
31		3104Hz	3079Hz
32		3204Hz	3225Hz
00		NO TONE	QUIETTERM

* *Code 27 is detected as code to apply quiet termination*
** *2713Hz returns INTELIPORT to idle*

Table 9. Transponder Frequency Chart

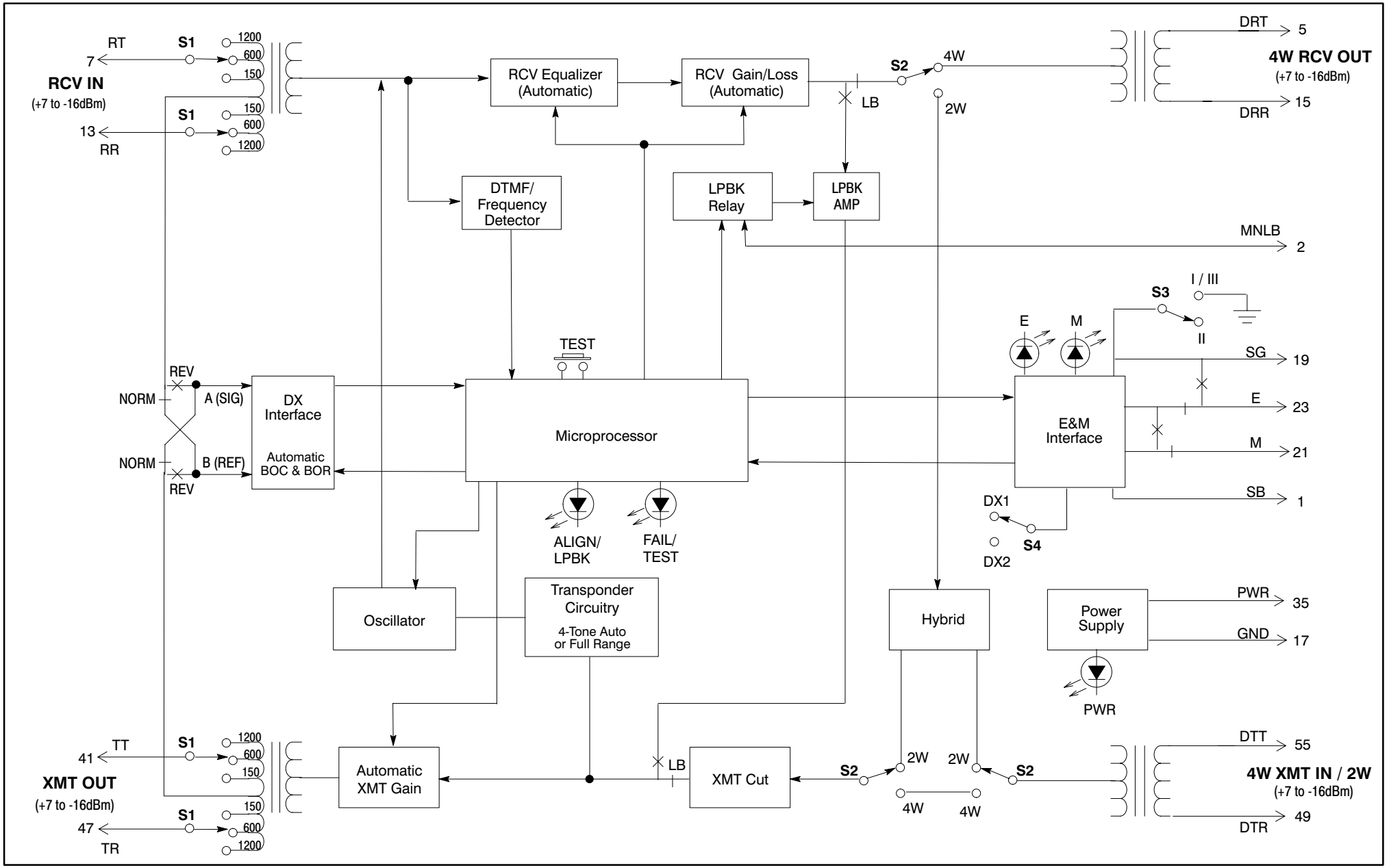

Figure 3. Block Diagram for the IDX5466