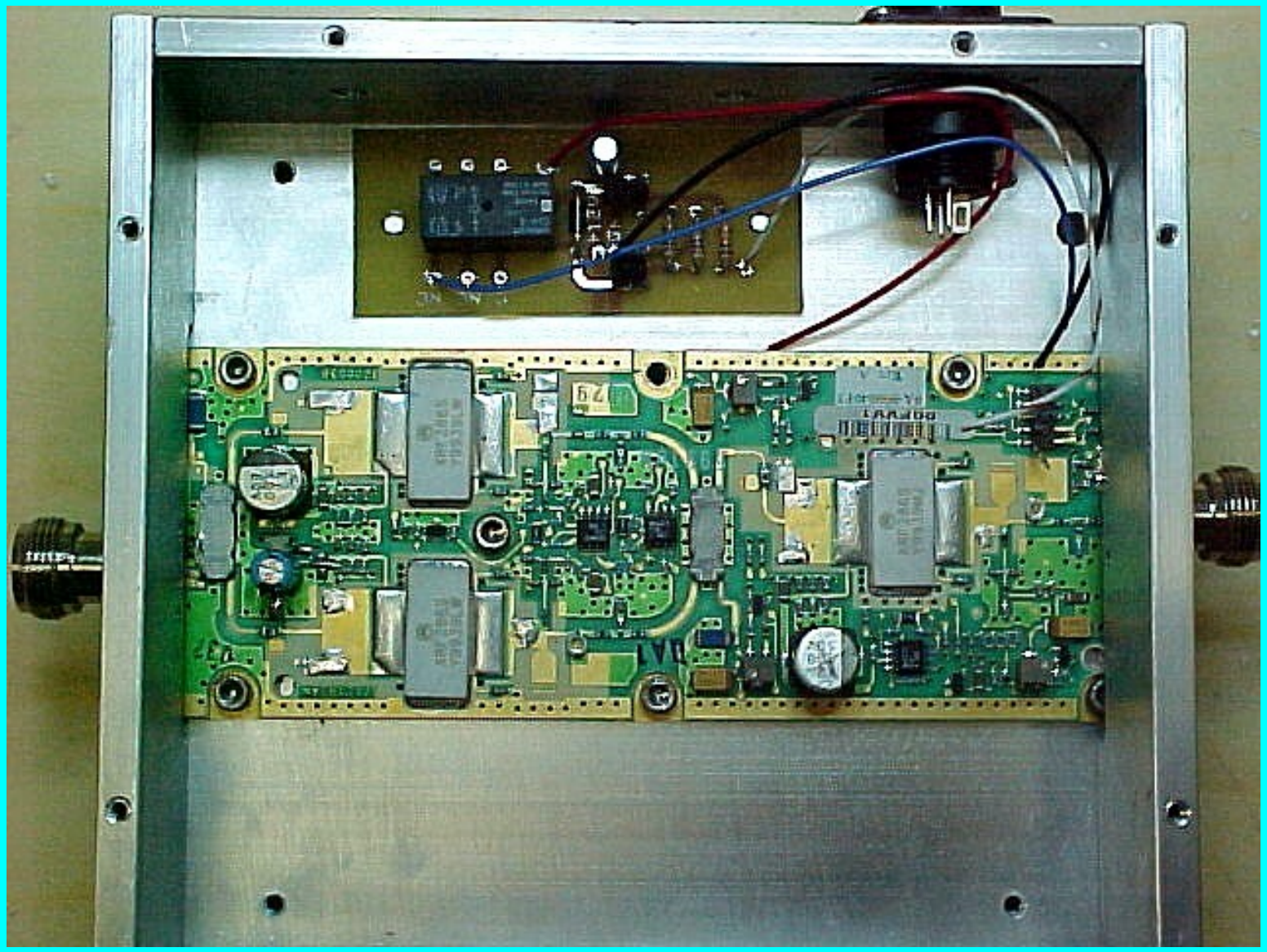
Microwave Update 2007

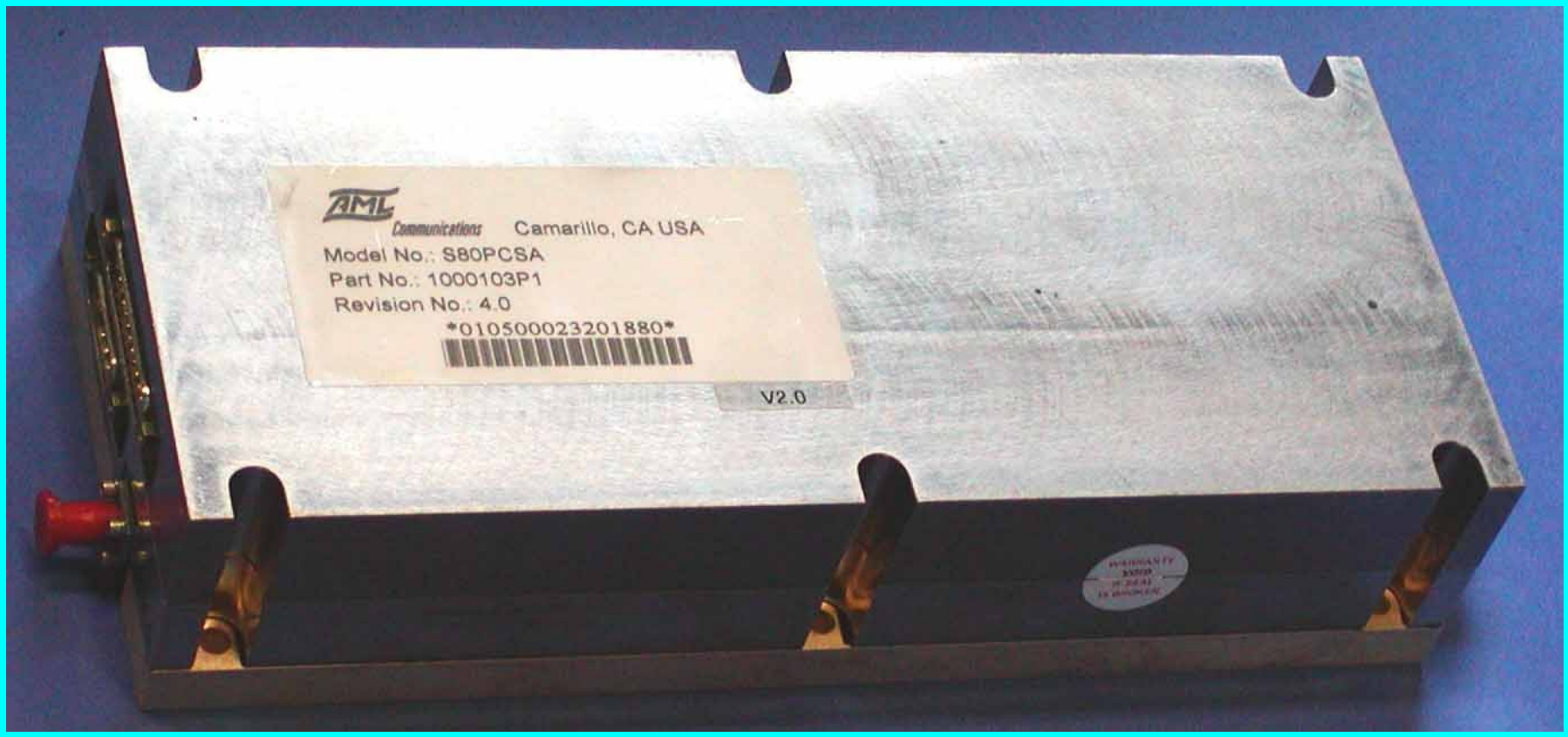
Surplus Power Amplifiers from Digital Communications Services or Real Power on 2.3GHz

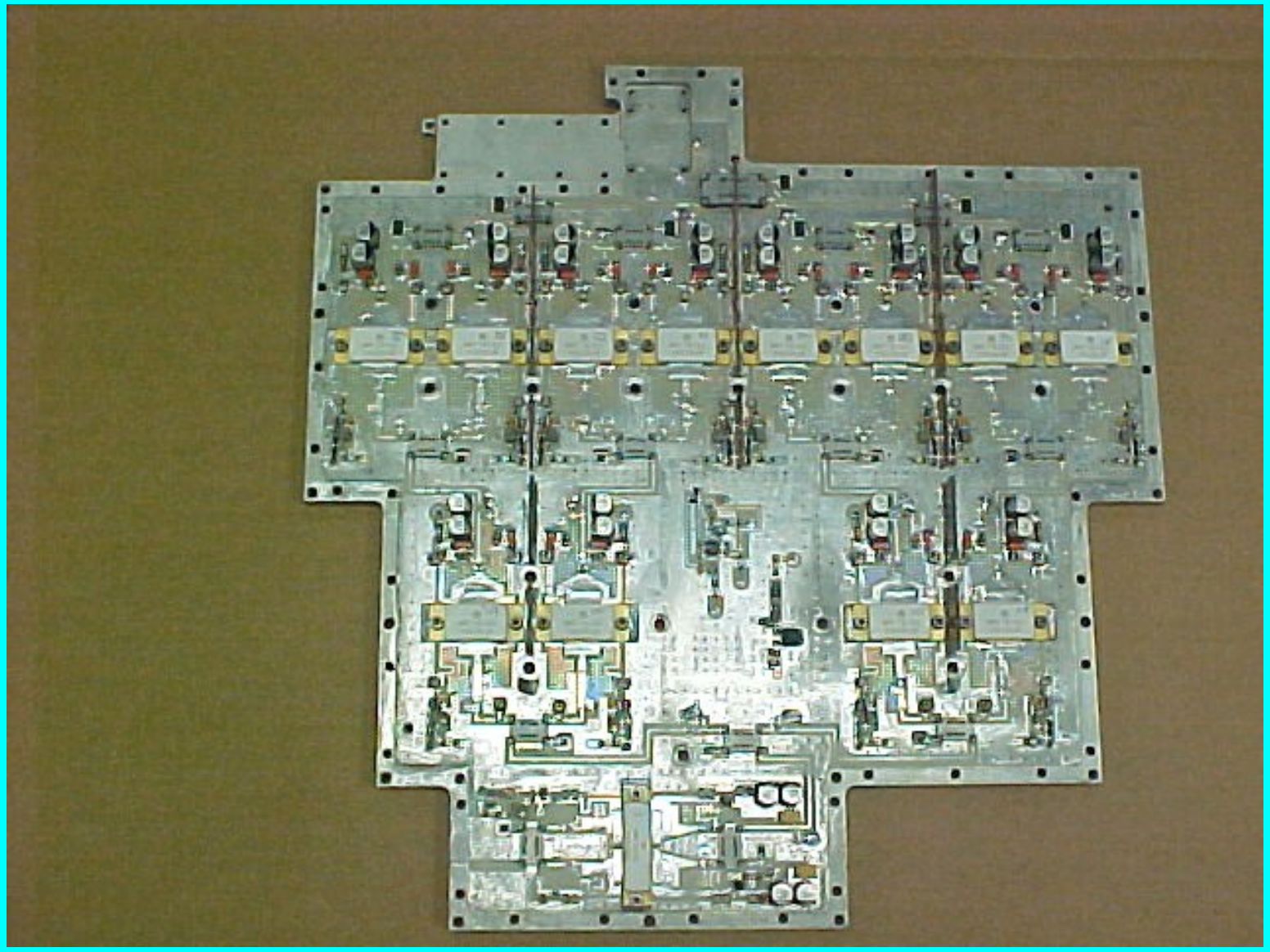
Steve Kostro, N2CEI

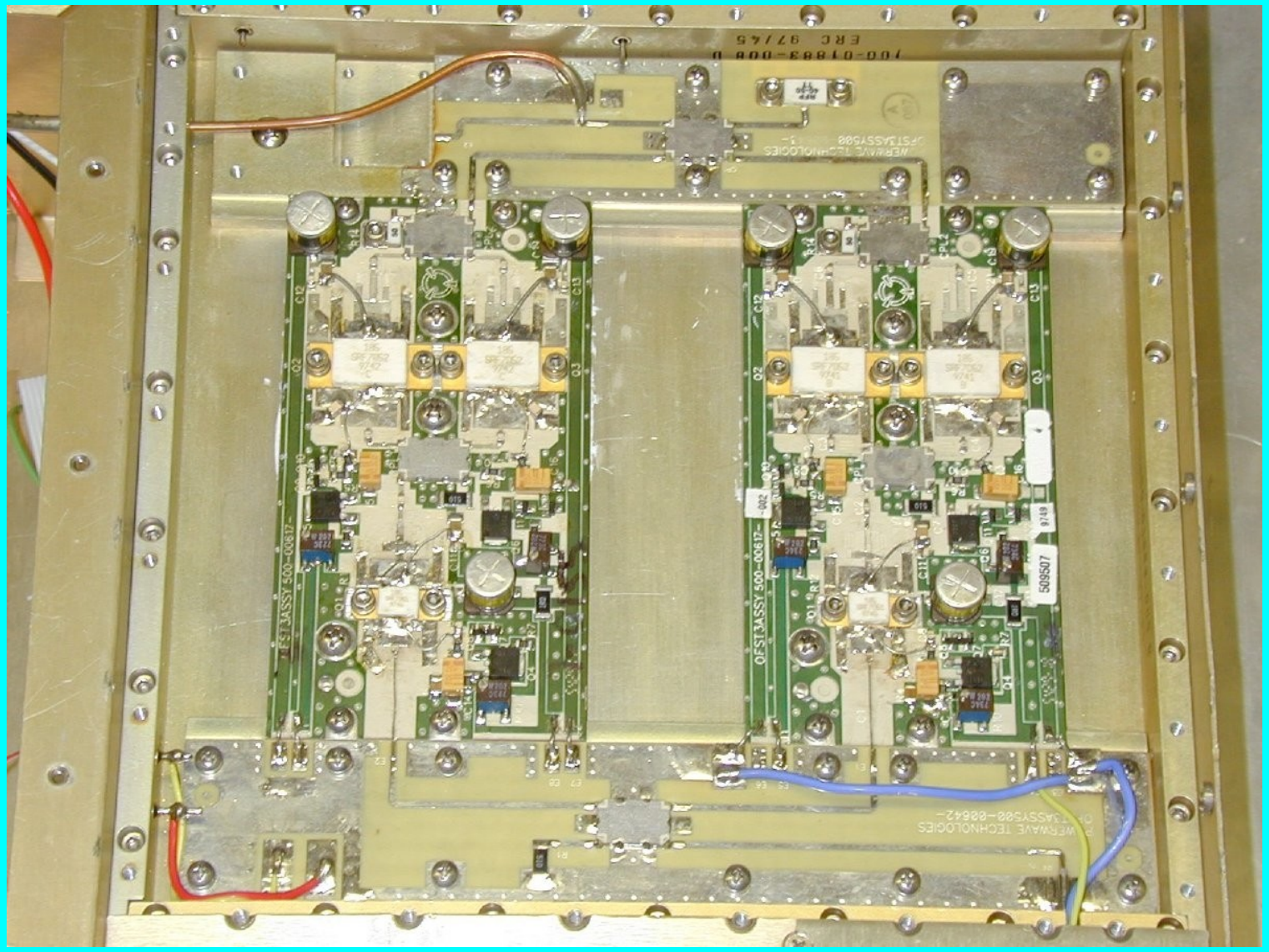


Spectrian/ Pyro Joe

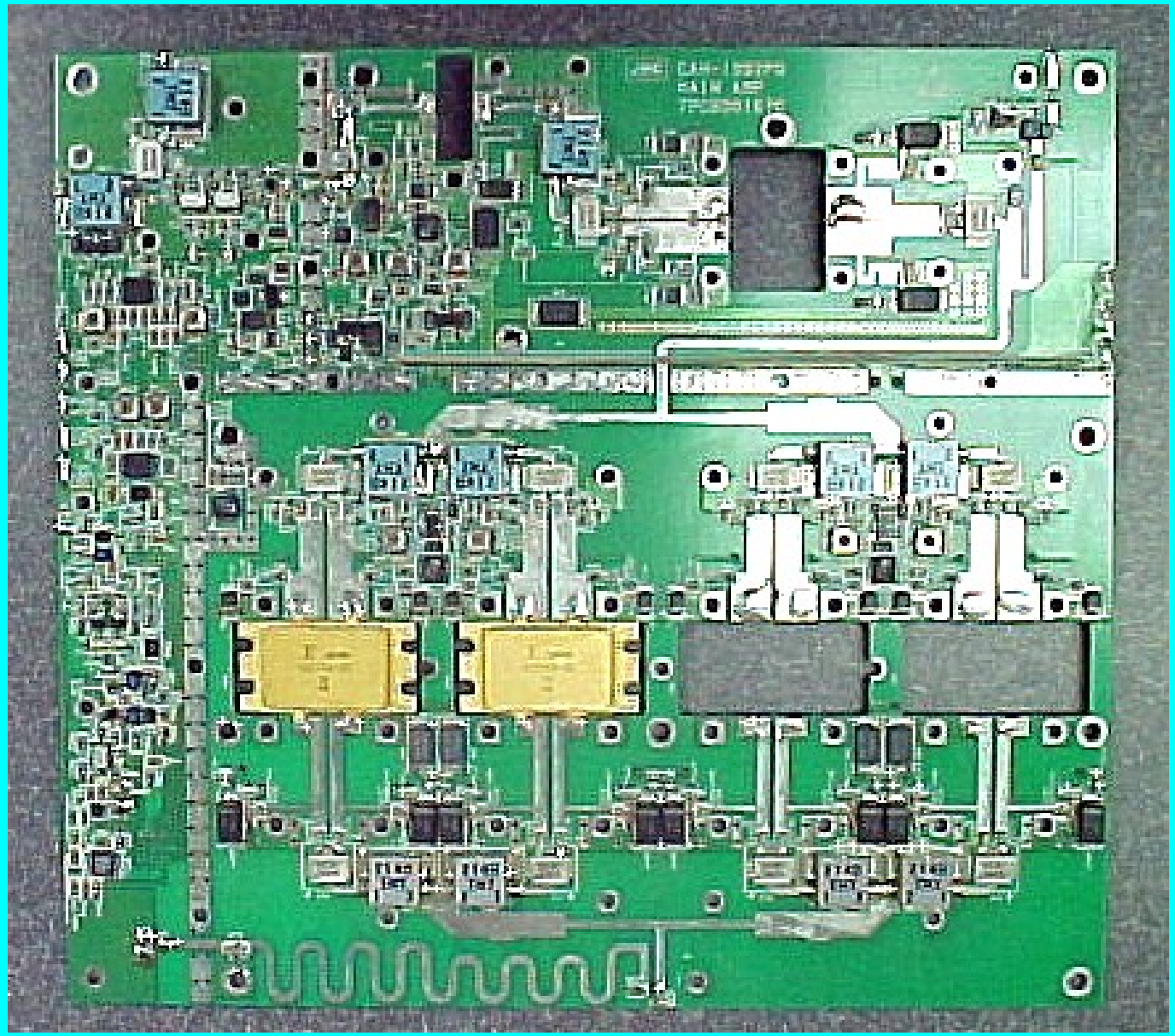



AML
Communications
Camarillo, CA USA
Model No.: S80PCSA
Part No.: 1000103P1
Revision No.: 4.0
0105000232018880
V2.0

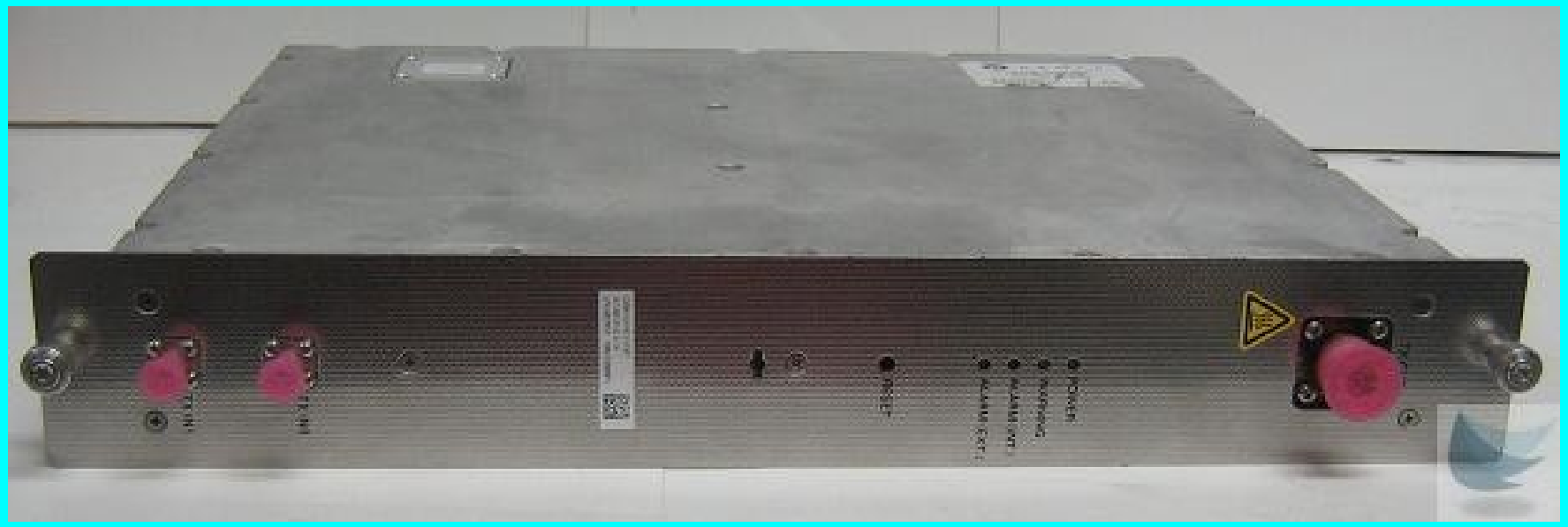




Powerwave

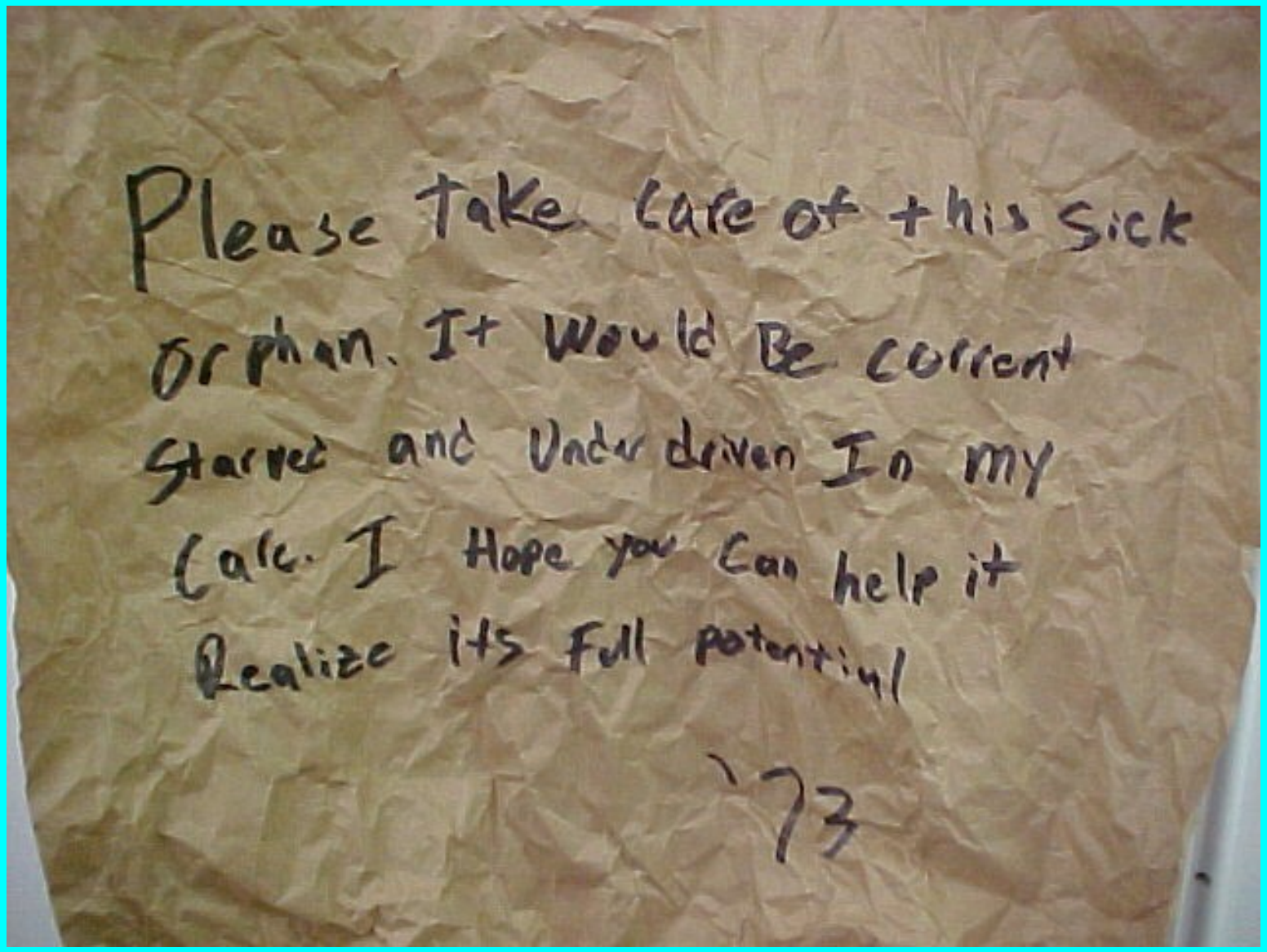


Fujitsu GaAs



REMEC QBS-457


TO WHOM
THIS MAY
CONSERN


Please take care of this sick
orphan. It would be current
starved and underdriven In my
care. I Hope you can help it
Realize its full potential
'73


DOWN EAST





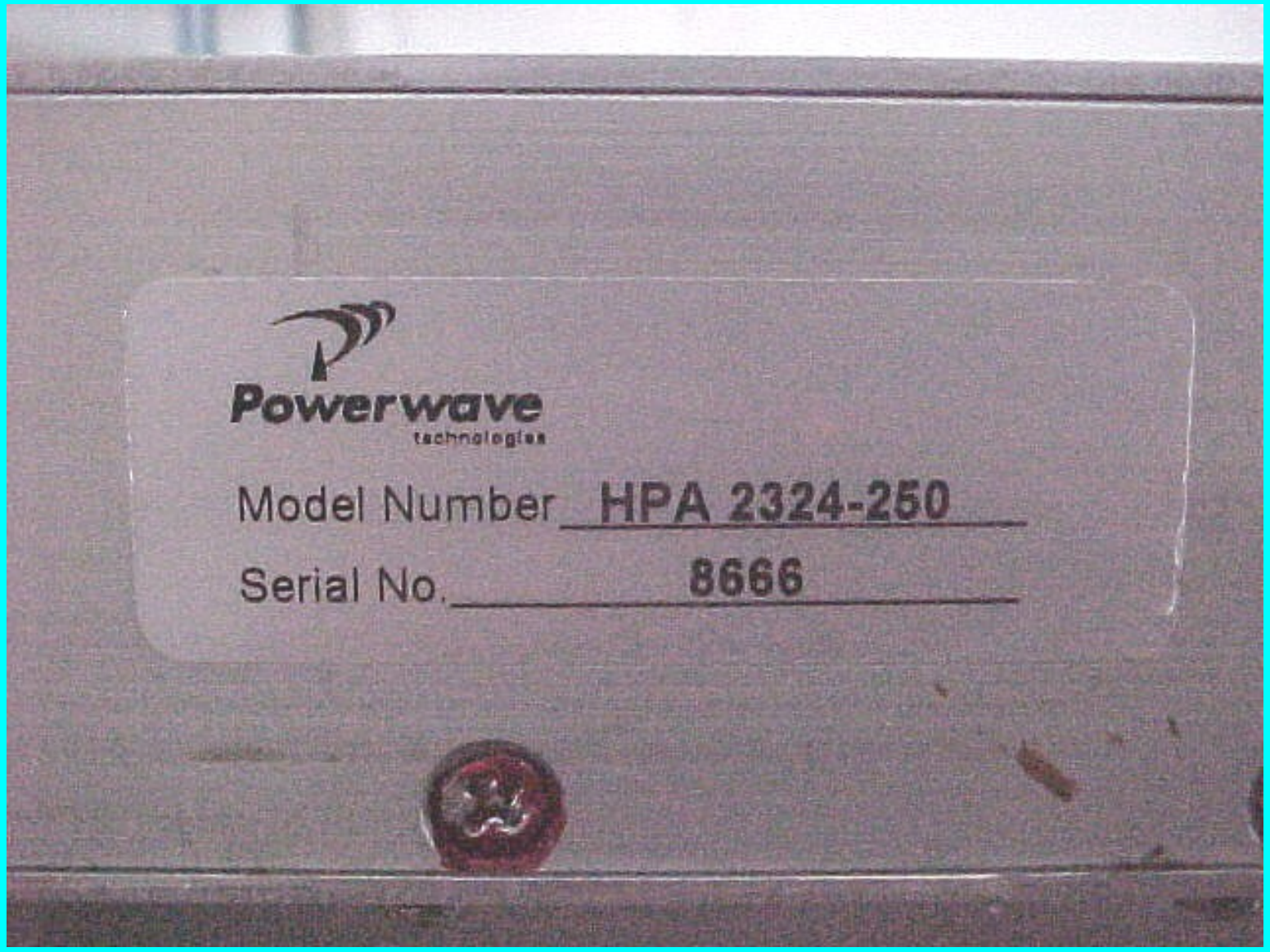




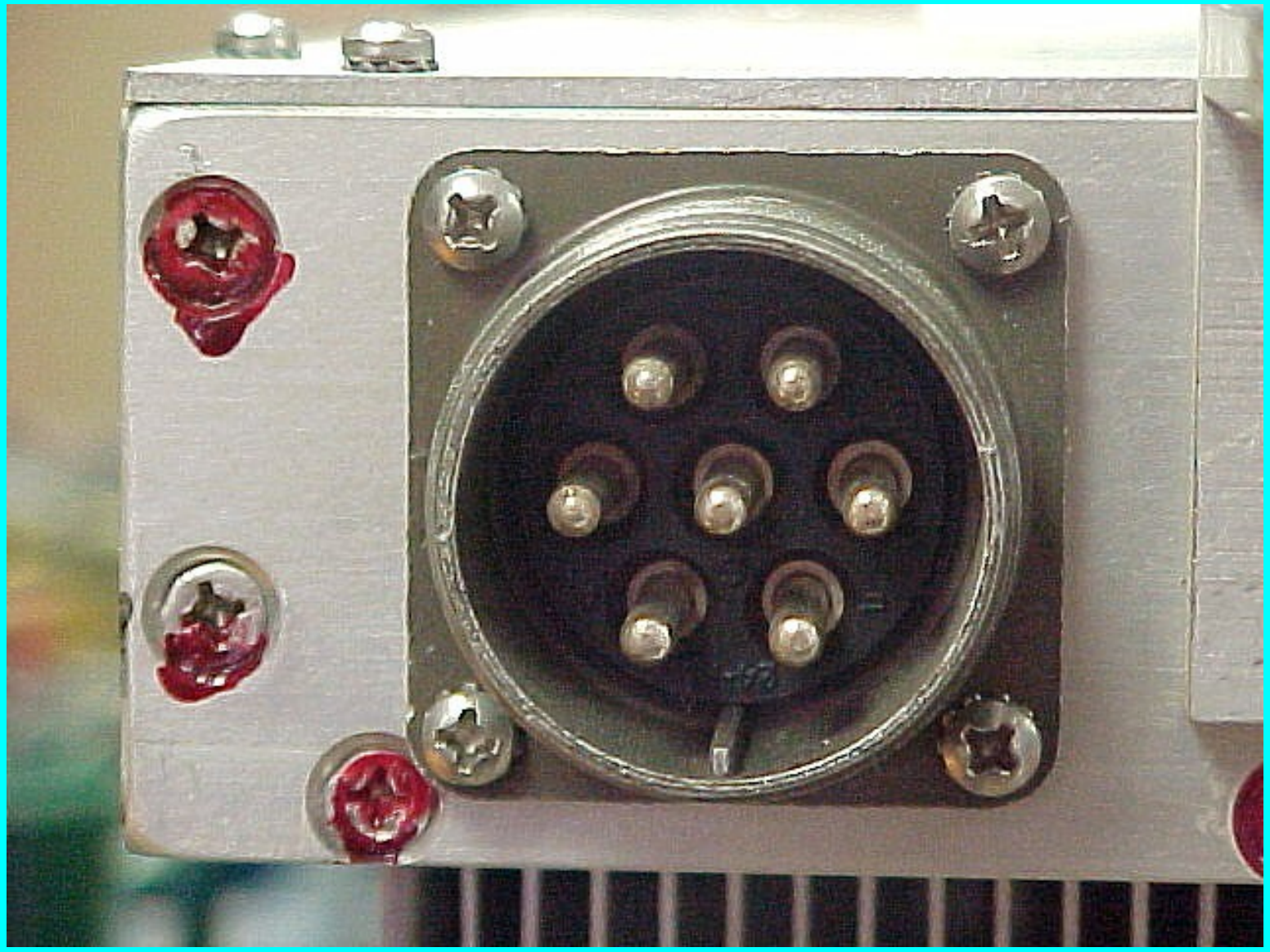


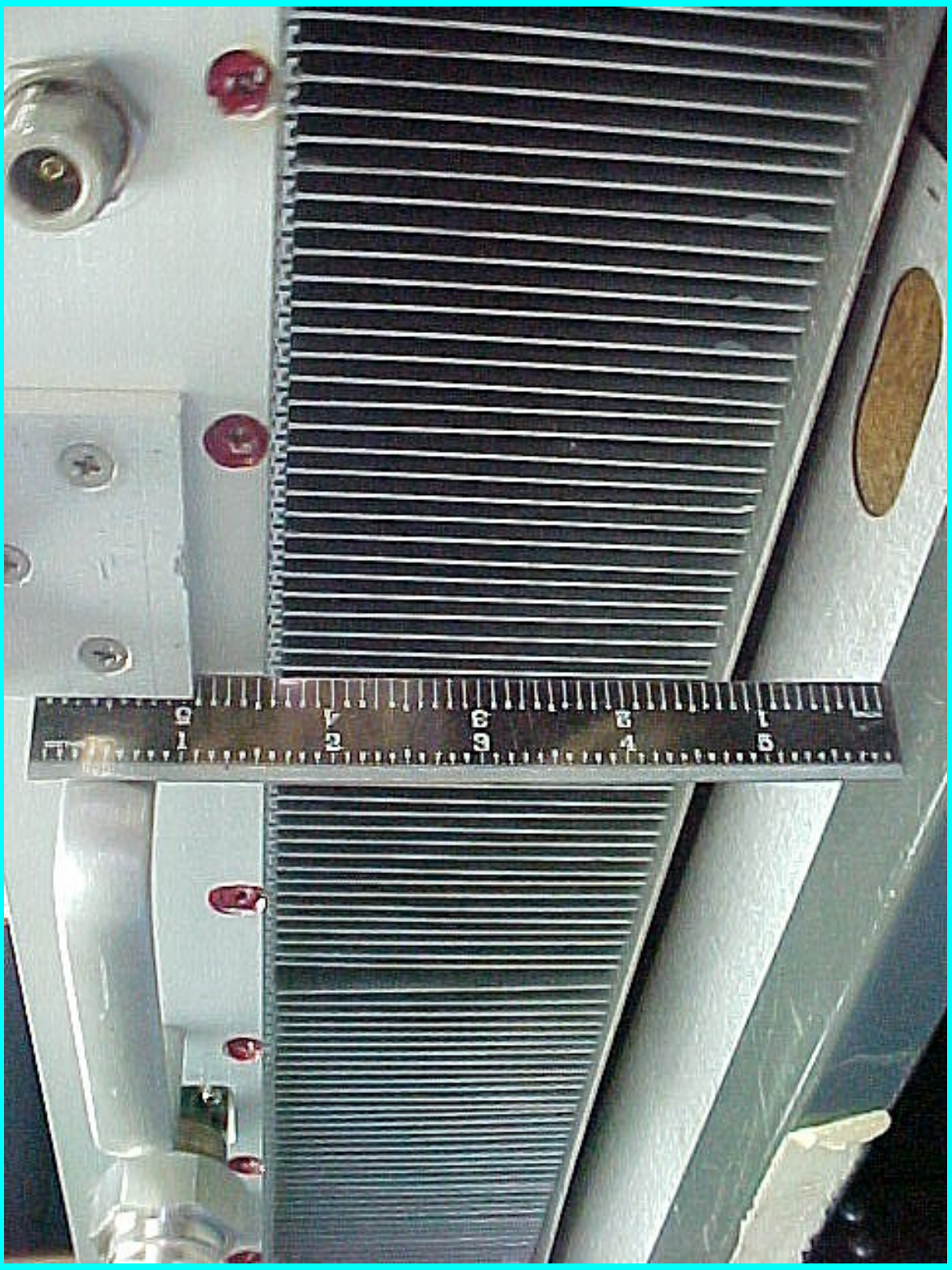



26

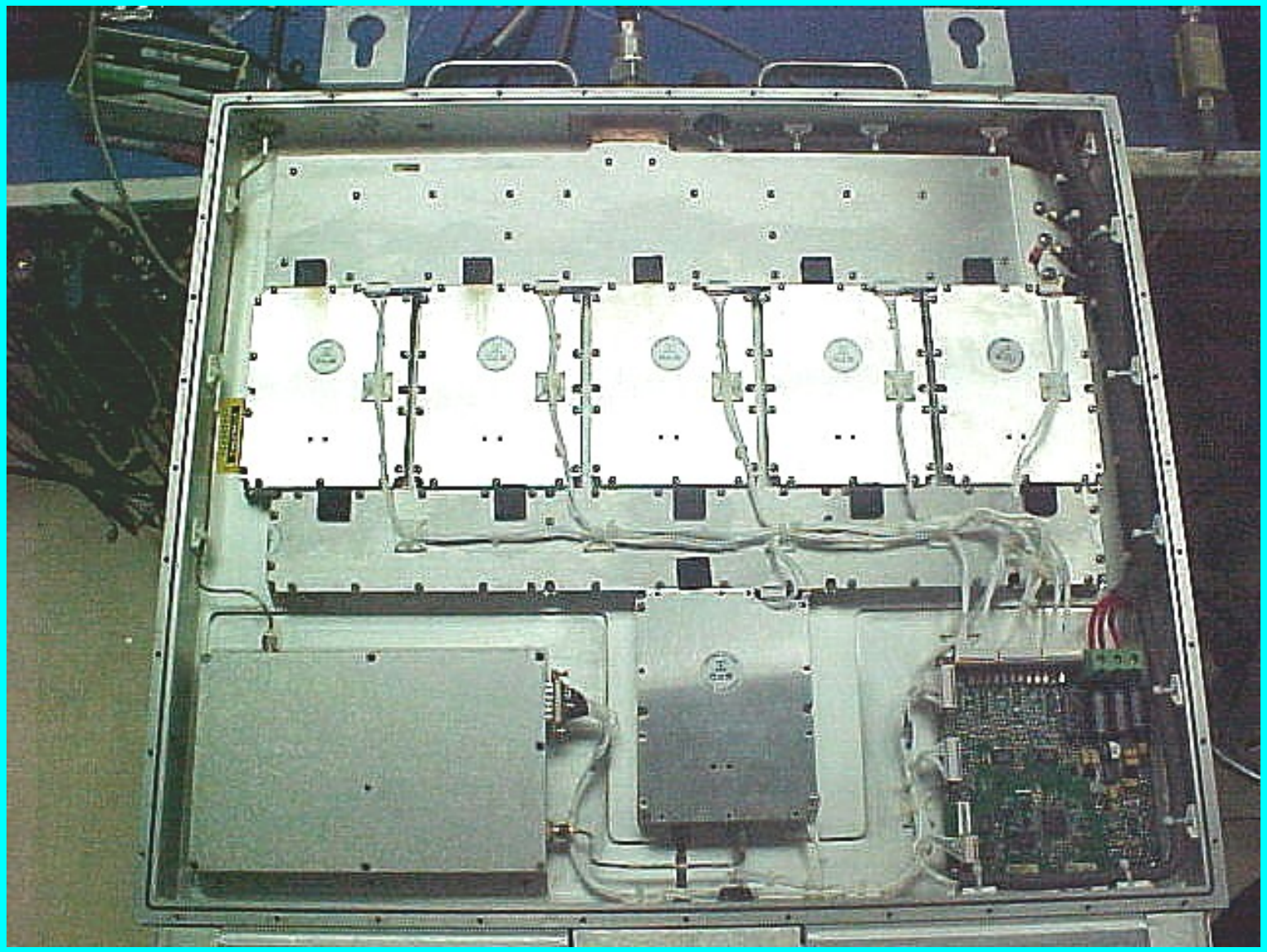

Powerwave
technologies
Model Number HPA 2324-250
Serial No. 8666



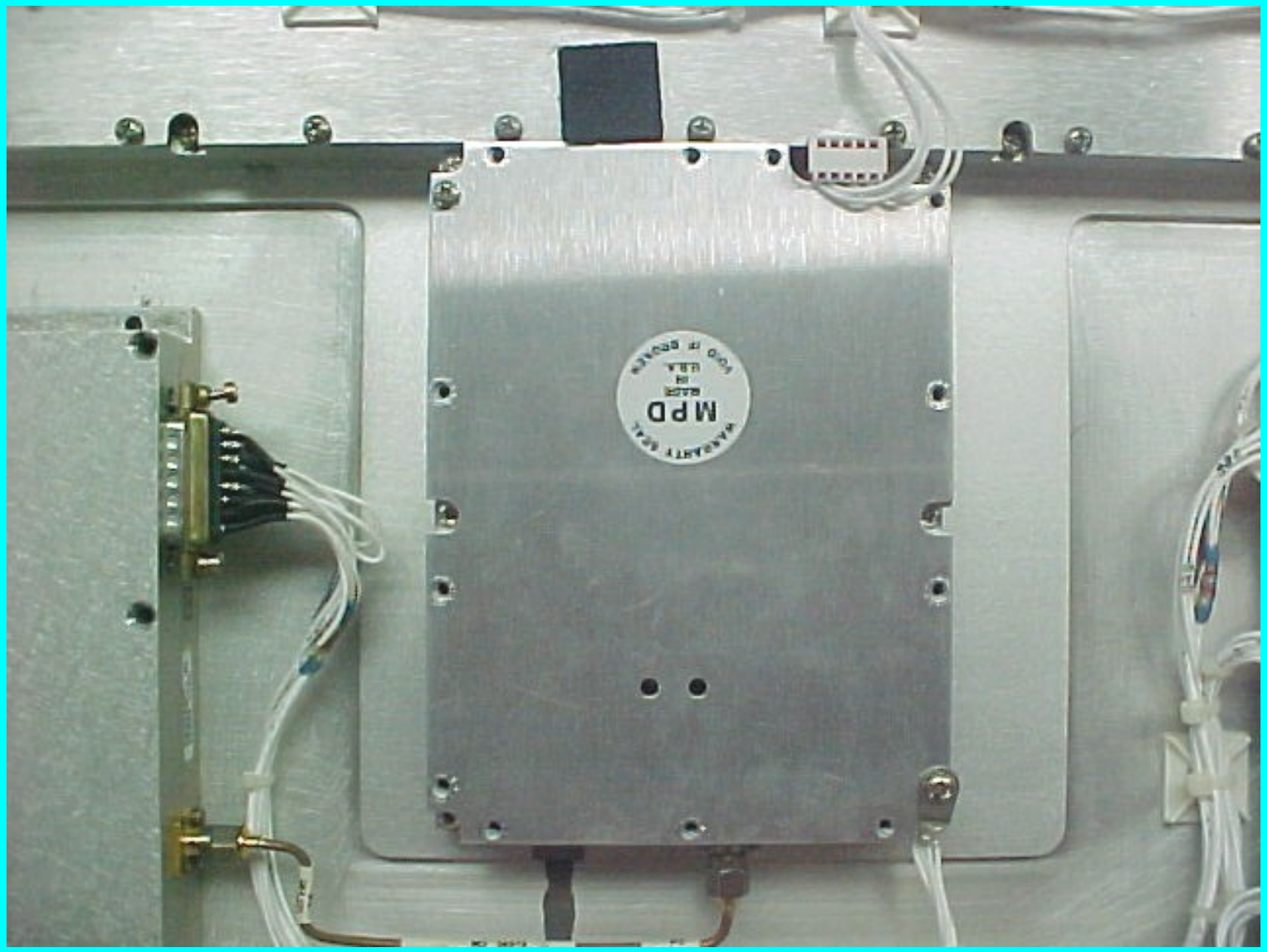


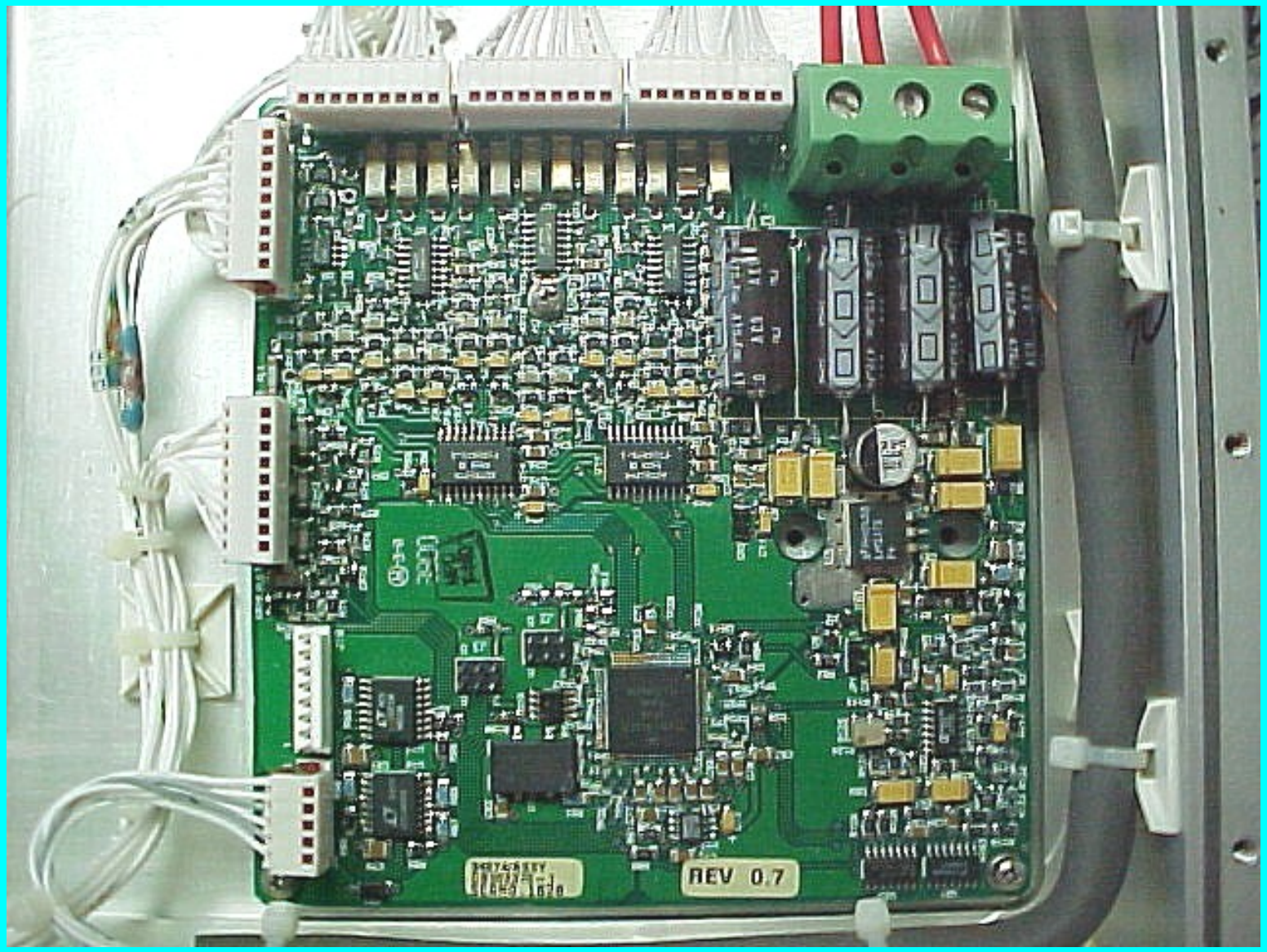



WARRAN
IF REM

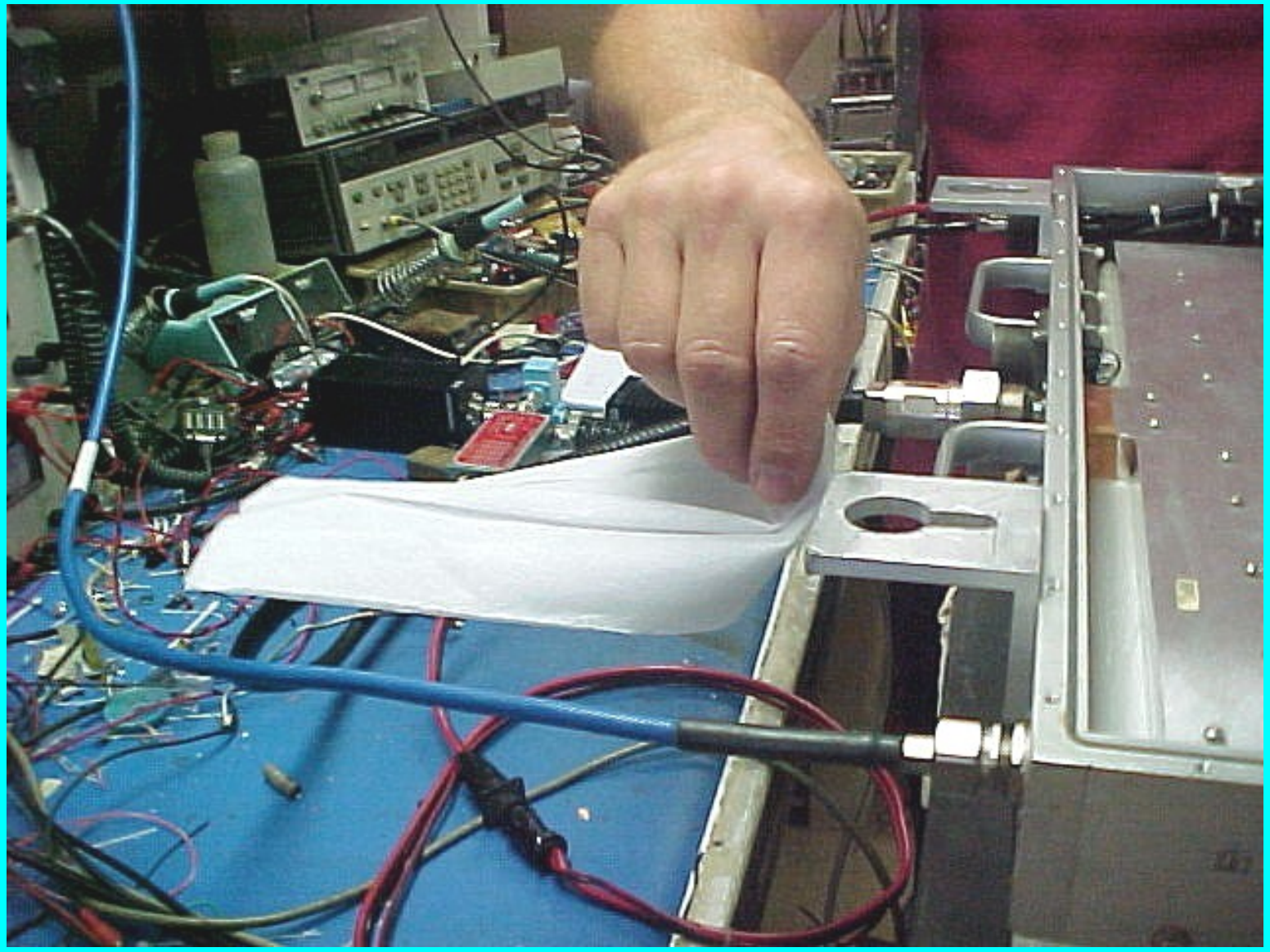




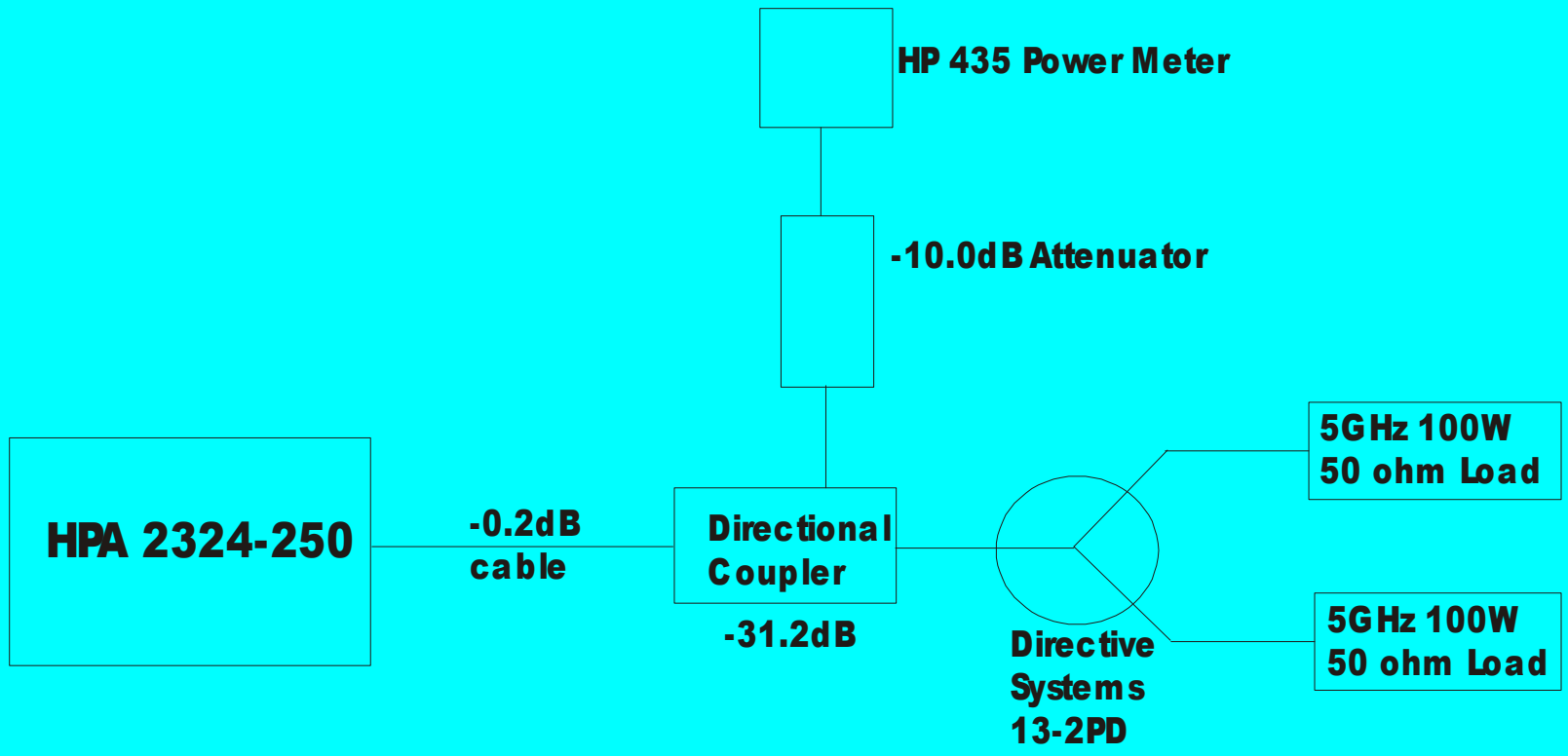

MPD


REV 0.7


24.19

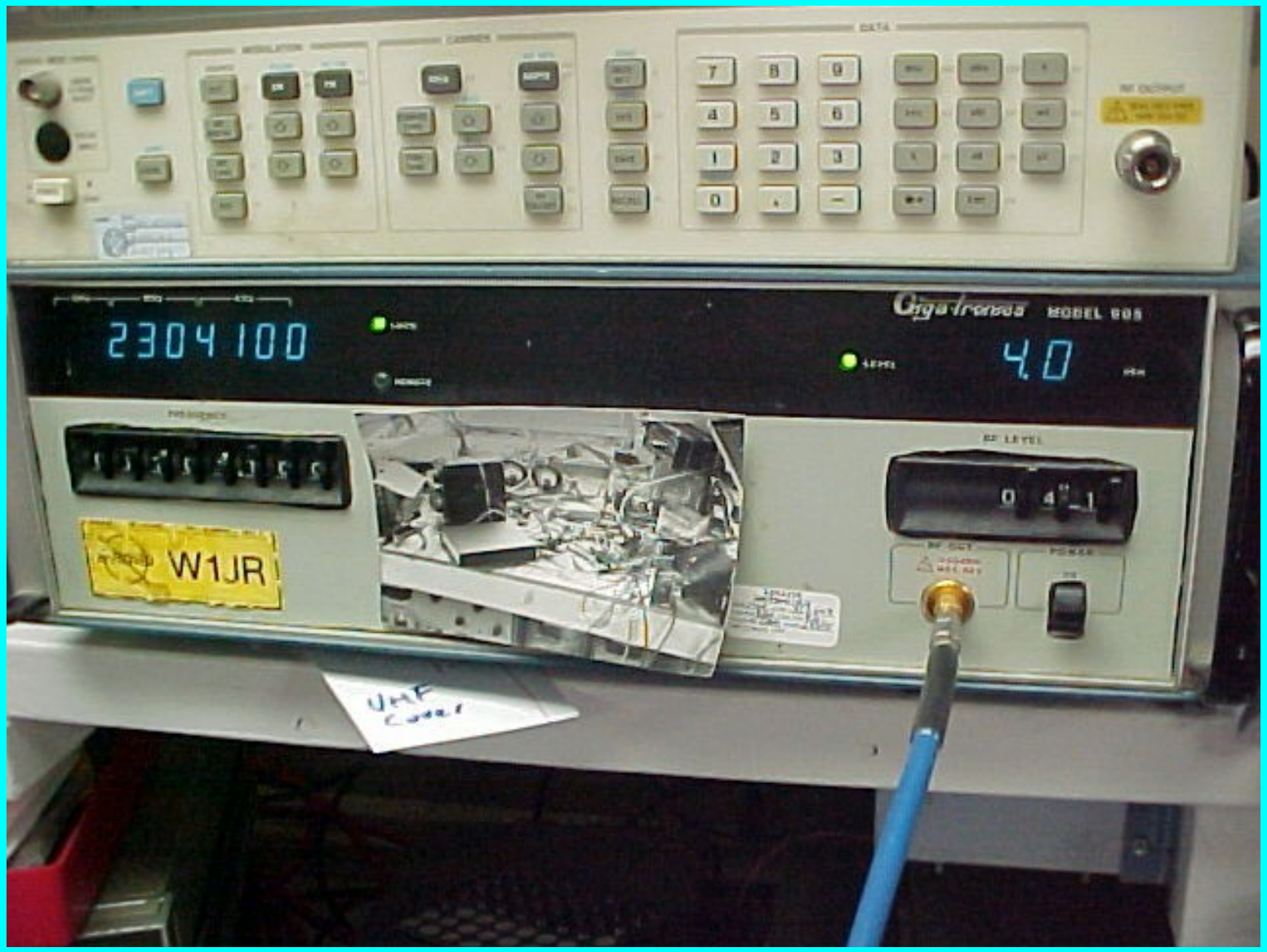




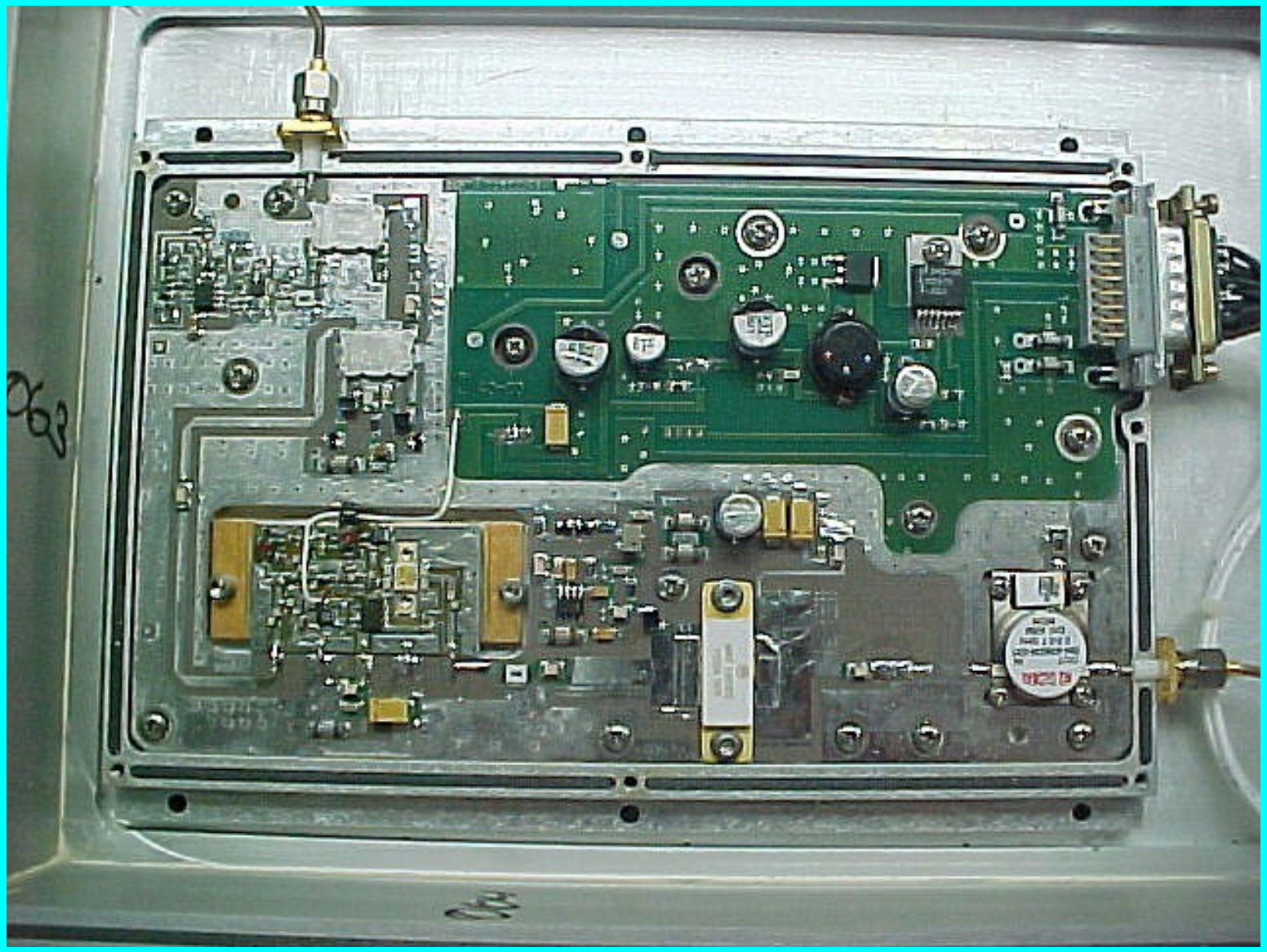


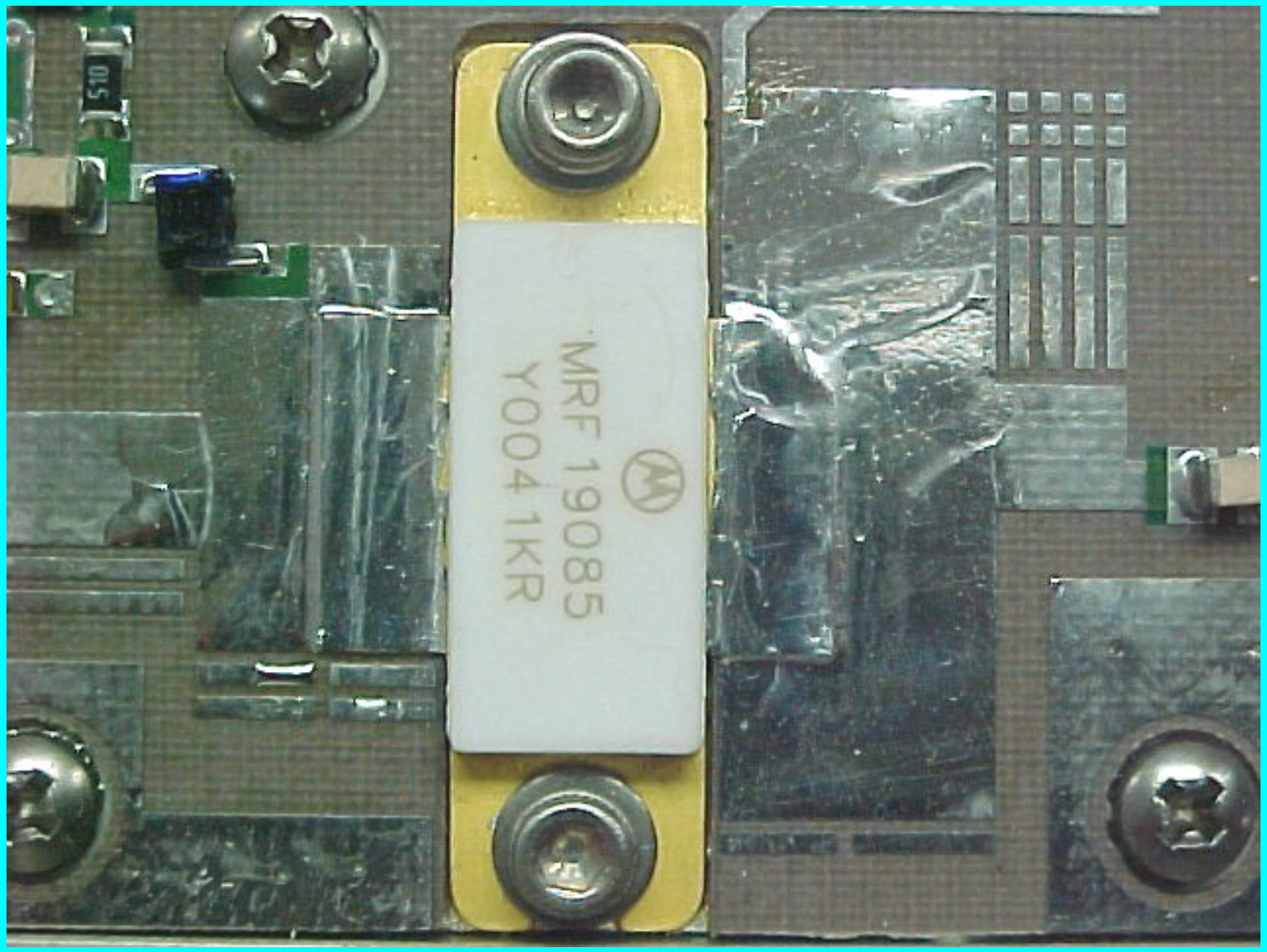
All measurements made at 2304MHz.
Total 41.0dB in measurement Path

Add 1.0dB to all meter measurements
for actual output power reading.


2304100
4.0
W1JR
UHF


µW-mW
.2
.4
.6
.8
1
2
3
CAL
0
0
-10
-5
-4
-3
-2
-1
0
dBm
HEWLETT · PACKARD
435B POWER METER
ZERO
RANGE
LINE
OFF
ON
100
30
10
20
15
10




MRF 19085
Y004 1KR

Freescale Semiconductor
Technical Data

Document Number: MRF19085
Rev. 8, 5/2006

RoHS

RF Power Field Effect Transistors

N-Channel Enhancement-Mode Lateral MOSFETs

Designed for PCN and PCS base station applications with frequencies from 1900 to 2000 MHz. Suitable for TDMA, CDMA and multicarrier amplifier applications.

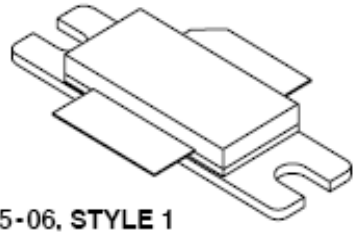
- Typical 2-Carrier N-CDMA Performance for V_{DD} = 26 Volts, I_{DQ} = 850 mA, P_{out} = 18 Watts Avg., f1 = 1960 MHz, f2 = 1962.5 MHz
  IS-95 CDMA (Pilot, Sync, Paging, Traffic Codes 8 Through 13)
  1.2288 MHz Channel Bandwidth Carrier. Adjacent Channels Measured over a 30 kHz Bandwidth at f1 -885 Khz and f2 +885 kHz. Distortion Products Measured over 1.2288 MHz Bandwidth at f1 -2.5 MHz and f2 +2.5 MHz. Peak/Avg. = 9.8 dB @ 0.01% Probability on CCDF.
  Output Power — 18 Watts Avg.
  Power Gain — 13.0 dB
  Efficiency — 23%
  ACPR — -51 dB
  IM3 — -36.5 dBc
- Capable of Handling 5:1 VSWR, @ 26 Vdc, 1960 MHz, 90 Watts CW Output Power

Features

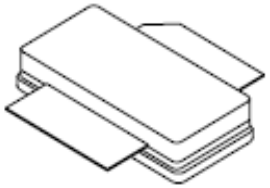
- Internally Matched for Ease of Use
- High Gain, High Efficiency and High Linearity
- Integrated ESD Protection
- Designed for Maximum Gain and Insertion Phase Flatness
- Excellent Thermal Stability
- Characterized with Series Equivalent Large-Signal Impedance Parameters
- Available with Low Gold Plating Thickness on Leads. L Suffix Indicates 40µ″ Nominal.
- RoHS Compliant
- In Tape and Reel. R3 Suffix = 250 Units per 56 mm, 13 Inch Reel.

MRF19085LR3
MRF19085LSR3

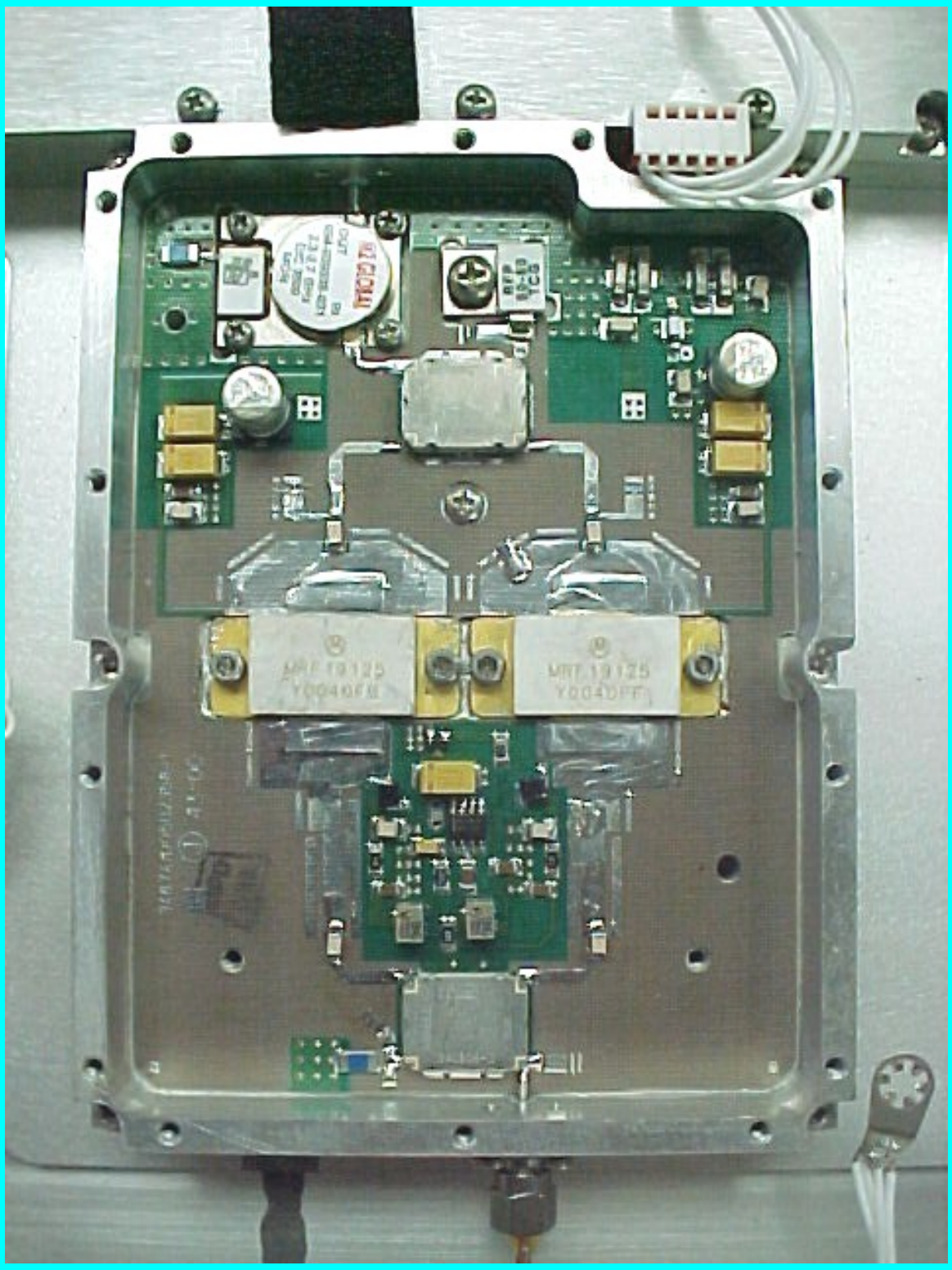
1930-1990 MHz, 90 W, 26 V
LATERAL N-CHANNEL
RF POWER MOSFETs

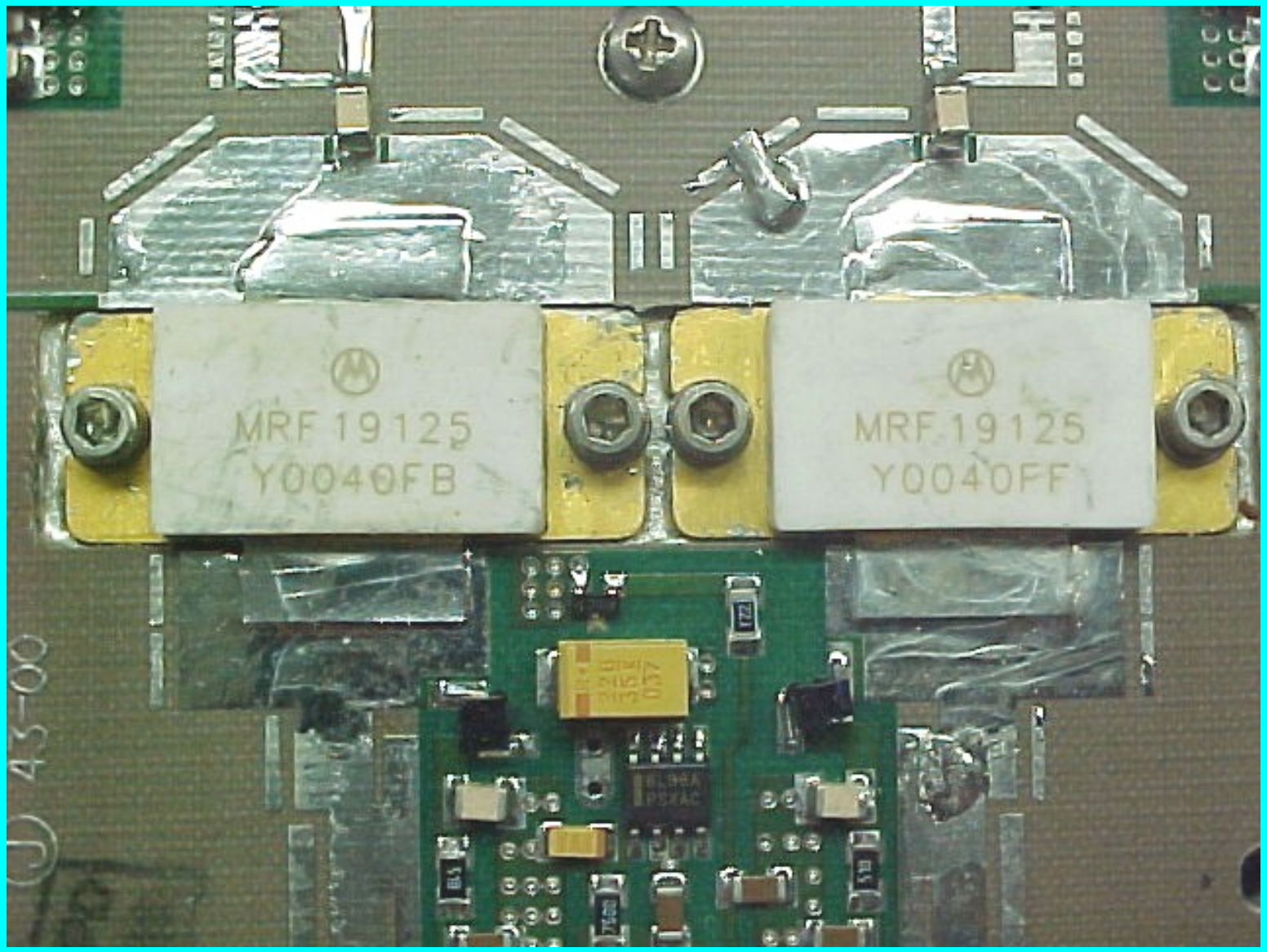


CASE 465-06, STYLE 1
NI-780
MRF19085LR3



CASE 465A-06, STYLE 1
NI-780S
MRF19085LSR3


MRF19125
MRF19125


MRF 19125
Y0040FB
MRF 19125
Y0040FF
43-00

Freescale Semiconductor
Technical Data

Document Number: MRF19125
Rev. 6, 4/2006

RoHS

RF Power Field Effect Transistors

N-Channel Enhancement-Mode Lateral MOSFETs

Designed for PCN and PCS base station applications with frequencies from 1900 to 2000 MHz. Suitable for TDMA, CDMA and multicarrier amplifier applications.

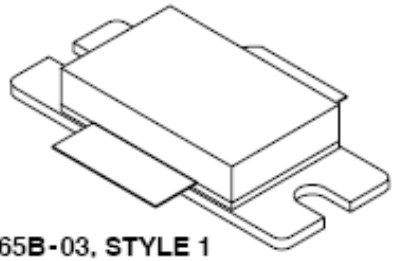
- Typical 2-Carrier N-CDMA Performance for V_{DD} = 26 Volts, I_{DQ} = 1300 mA, f1 = 1958.75 MHz, f2 = 1961.25 MHz
  IS-95 CDMA (Pilot, Sync, Paging, Traffic Codes 8 Through 13)
  1.2288 MHz Channel Bandwidth Carrier. Adjacent Channels Measured over a 30 kHz Bandwidth at f1 -885 kHz and f2 +885 kHz. Distortion Products Measured over 1.2288 MHz Bandwidth at f1 -2.5 MHz and f2 +2.5 MHz. Peak/Avg. = 9.8 dB @ 0.01% Probability on CCDF.
  Output Power — 24 Watts Avg.
  Power Gain — 13.6 dB
  Efficiency — 22%
  ACPR — -51 dB
  IM3 — -37.0 dBc
- Capable of Handling 5:1 VSWR, @ 26 Vdc, 1960 MHz, 125 Watts CW Output Power

Features

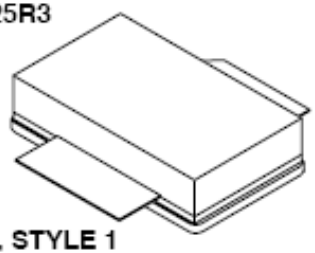
- Internally Matched for Ease of Use
- High Gain, High Efficiency and High Linearity
- Integrated ESD Protection
- Designed for Maximum Gain and Insertion Phase Flatness
- Excellent Thermal Stability
- Characterized with Series Equivalent Large-Signal Impedance Parameters
- RoHS Compliant
- In Tape and Reel. R3 Suffix = 250 Units per 56 mm, 13 inch Reel.

MRF19125R3
MRF19125SR3

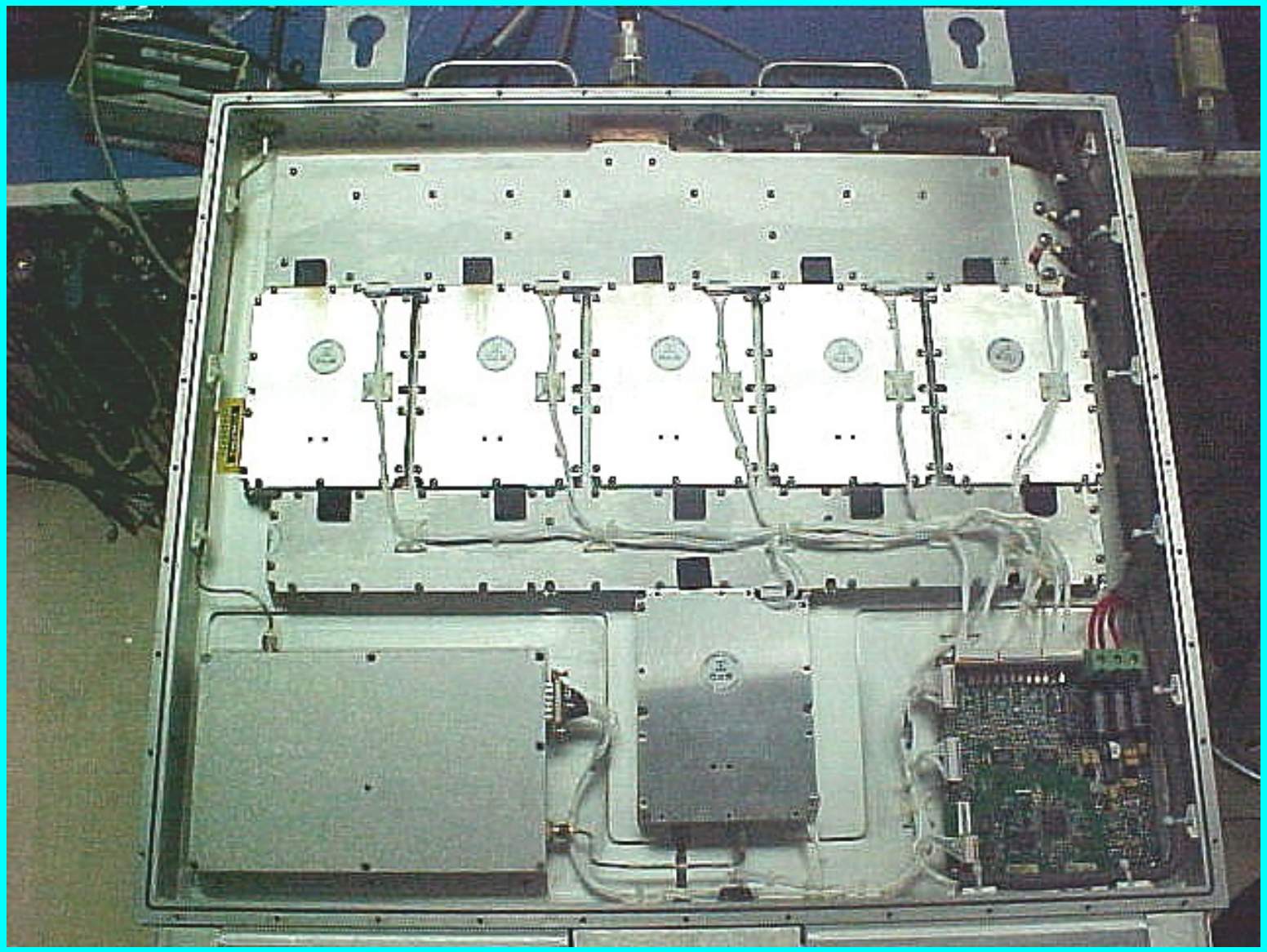
1930-1990 MHz, 125 W, 26 V
LATERAL N-CHANNEL
RF POWER MOSFETs

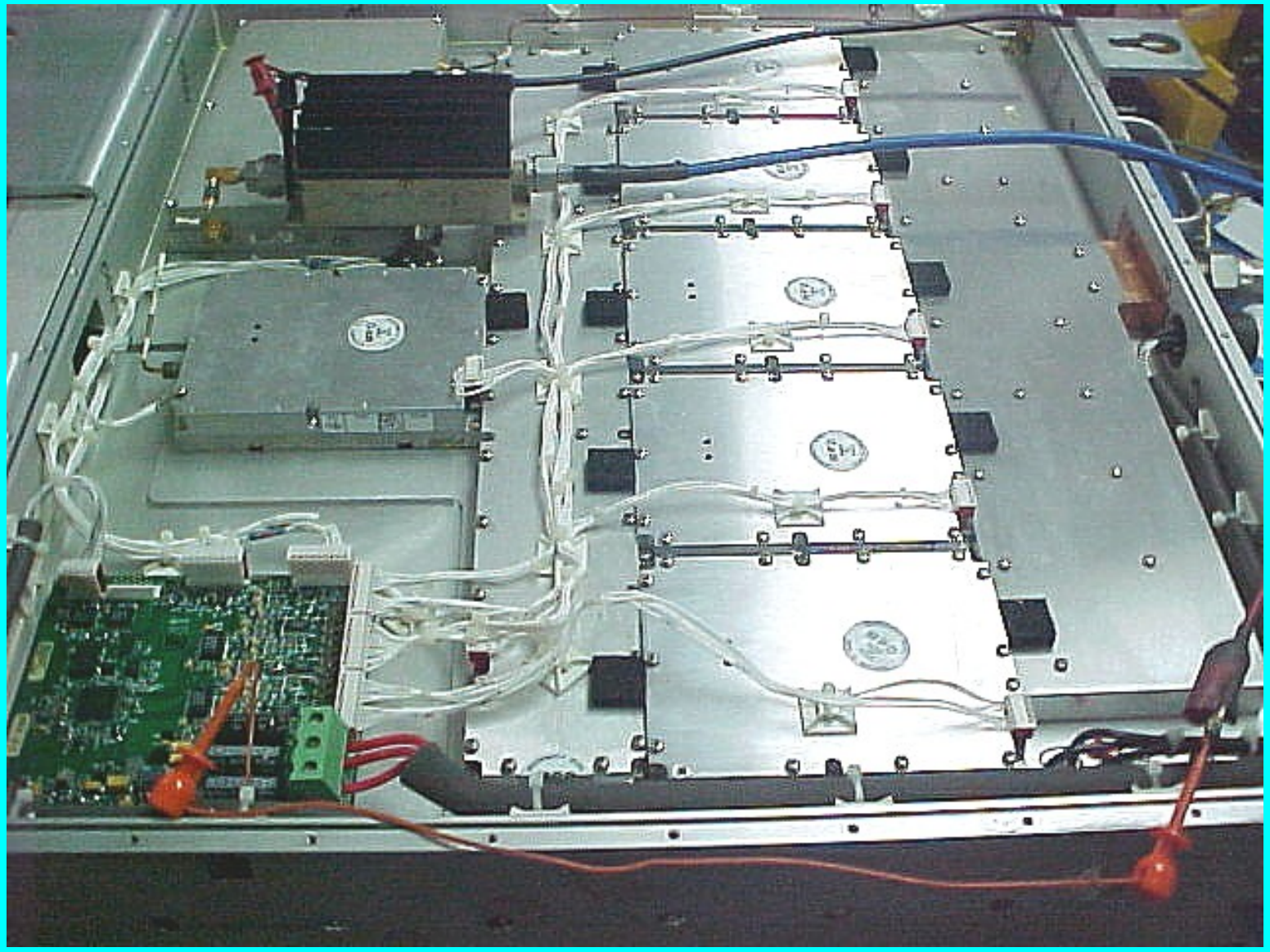


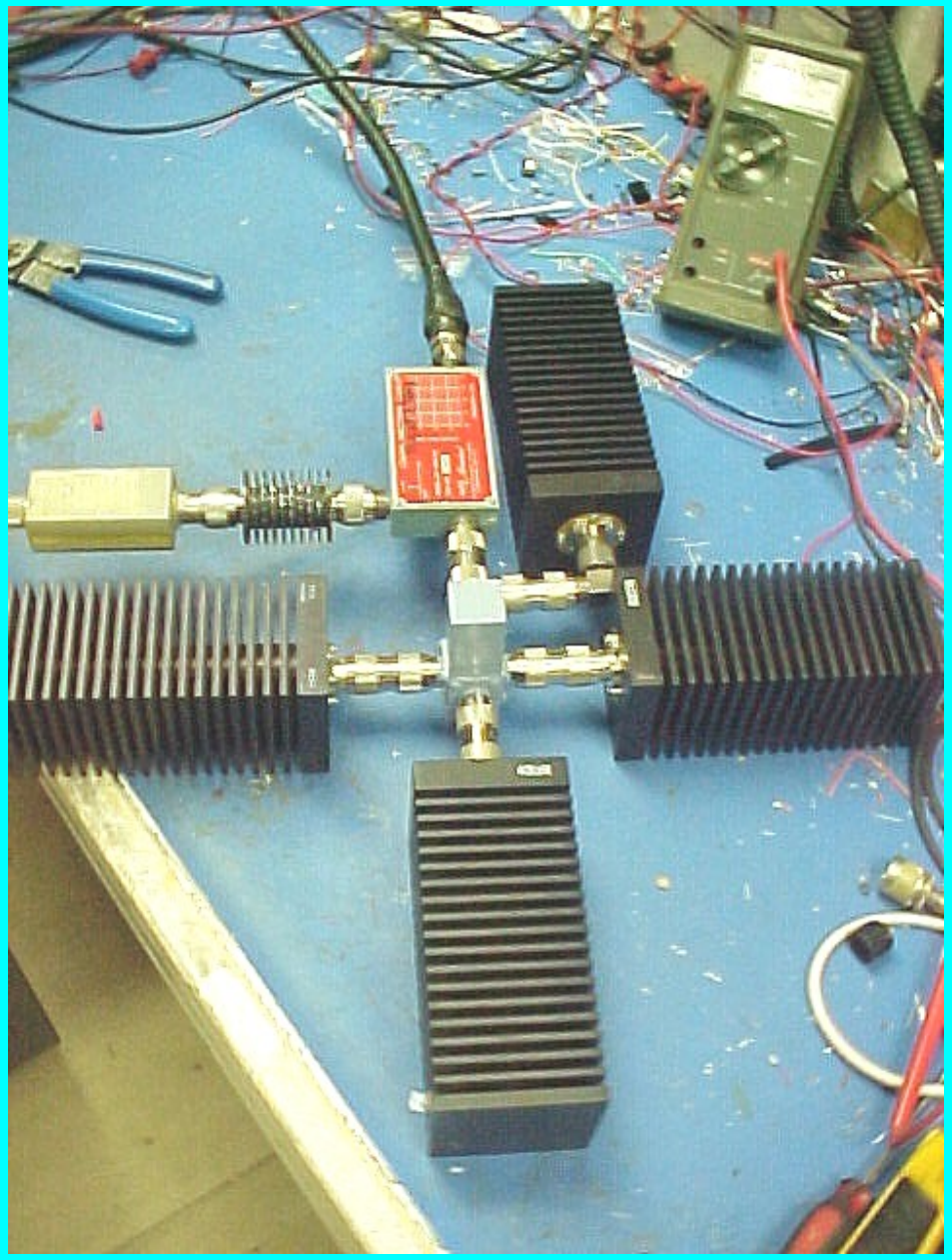
CASE 465B-03, STYLE 1
NI-880
MRF191225R3



CASE 465C-02, STYLE 1
NI-880S
MRF19125SR3

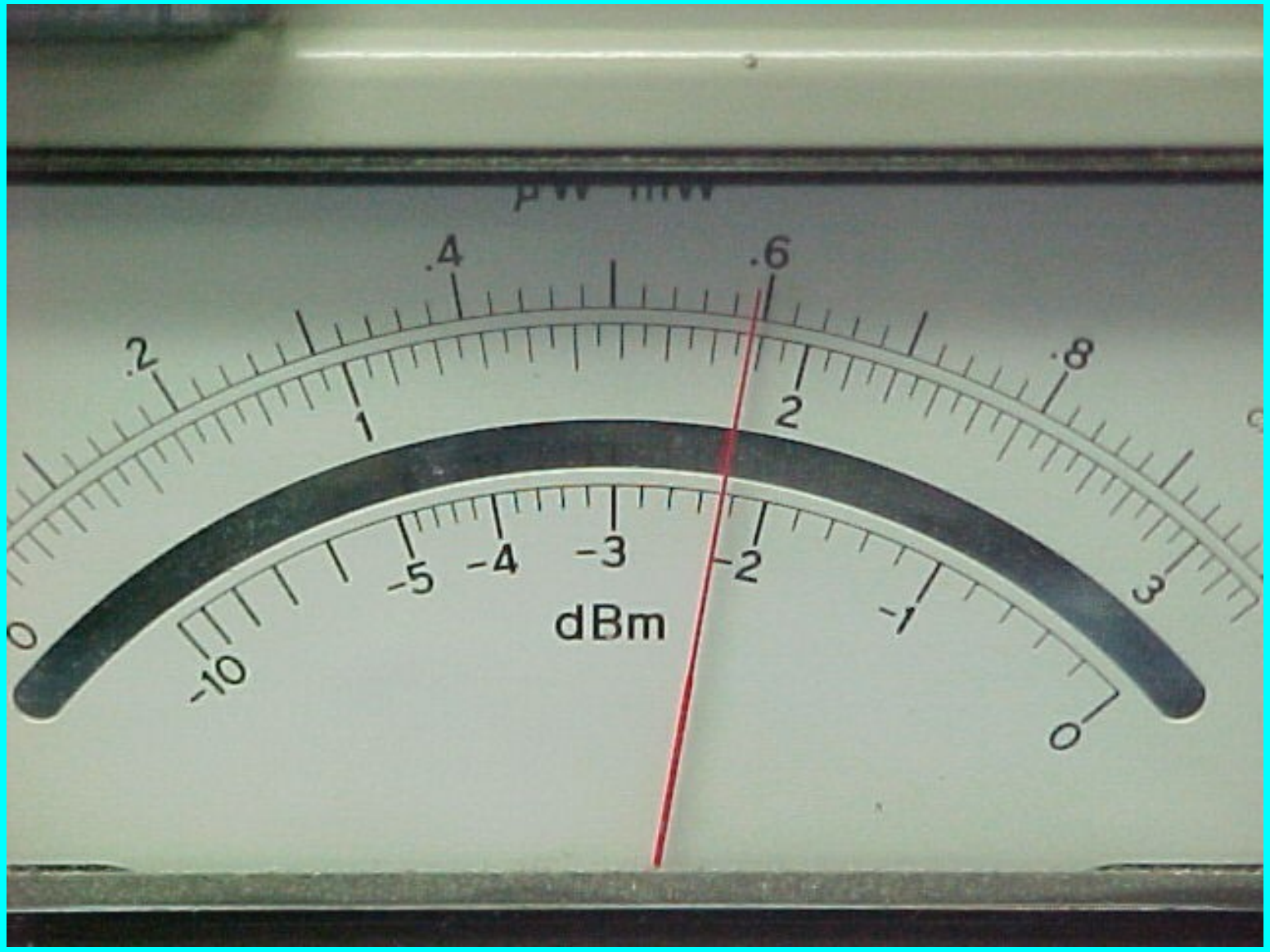


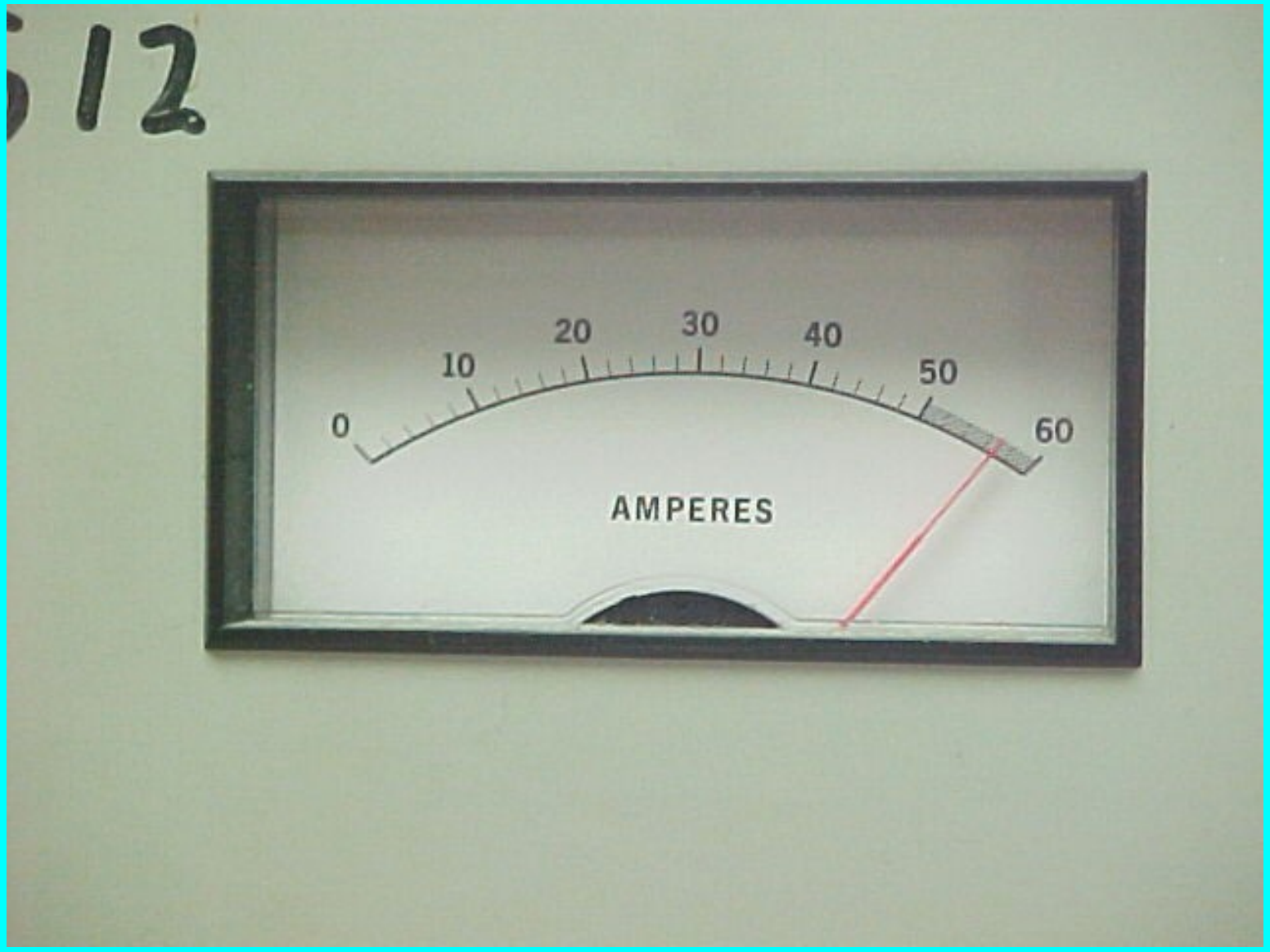


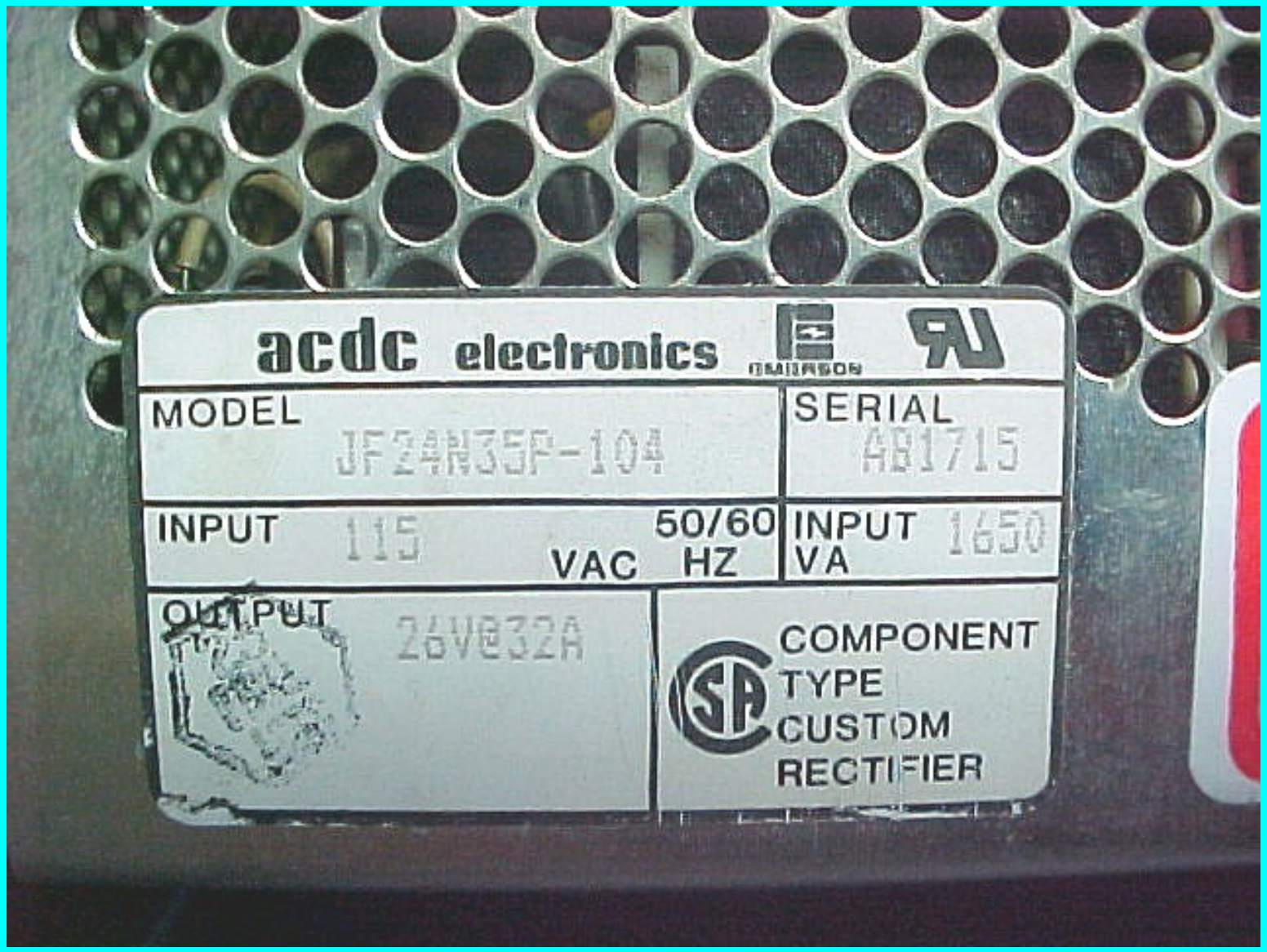


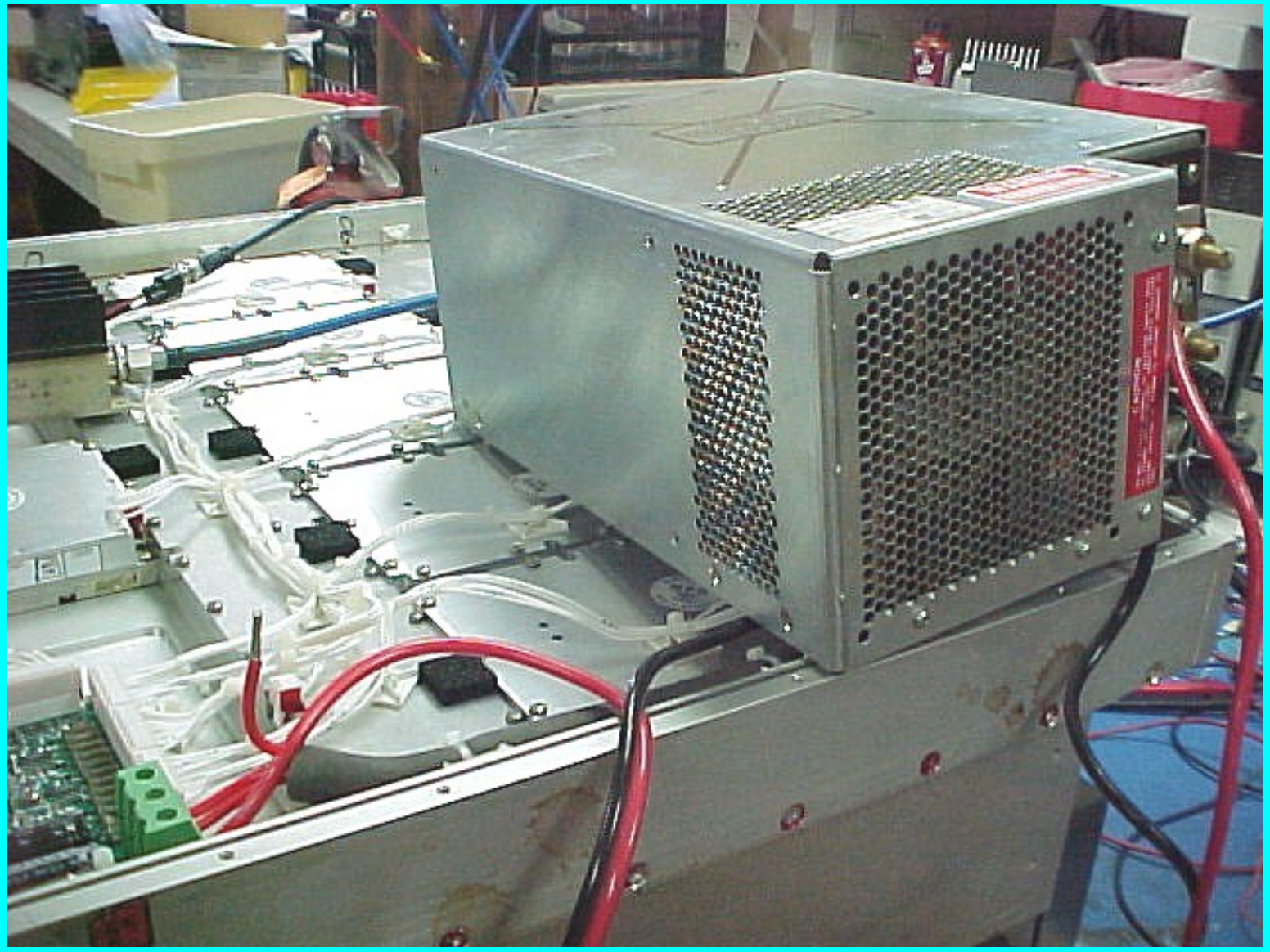

HEWLETT · PACKARD
435B POWER M
RO
RANGE
OFF
CTOR%
94
96
98
POWE
(1.00mW
OUT
dBm
mW
μW
0350-0149

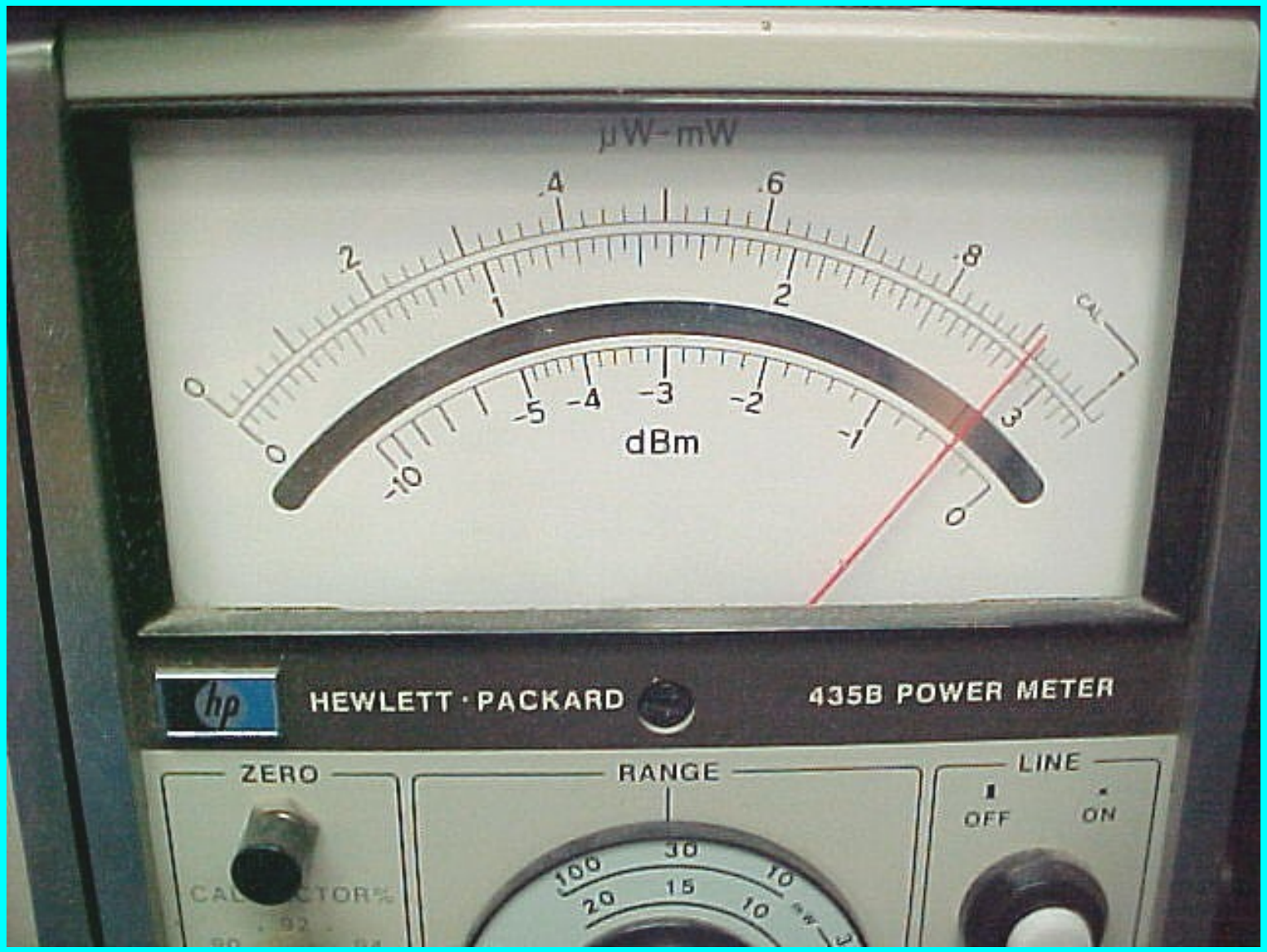

μW-mW
.4
.6
.2
.8
1
2
CAL
0
0
-5
-4
-3
-2
-1
3
-10
0
dBm
HEWLETT · PACKARD
435B POWER METER
ZERO
RANGE
LINE
OFF
ON

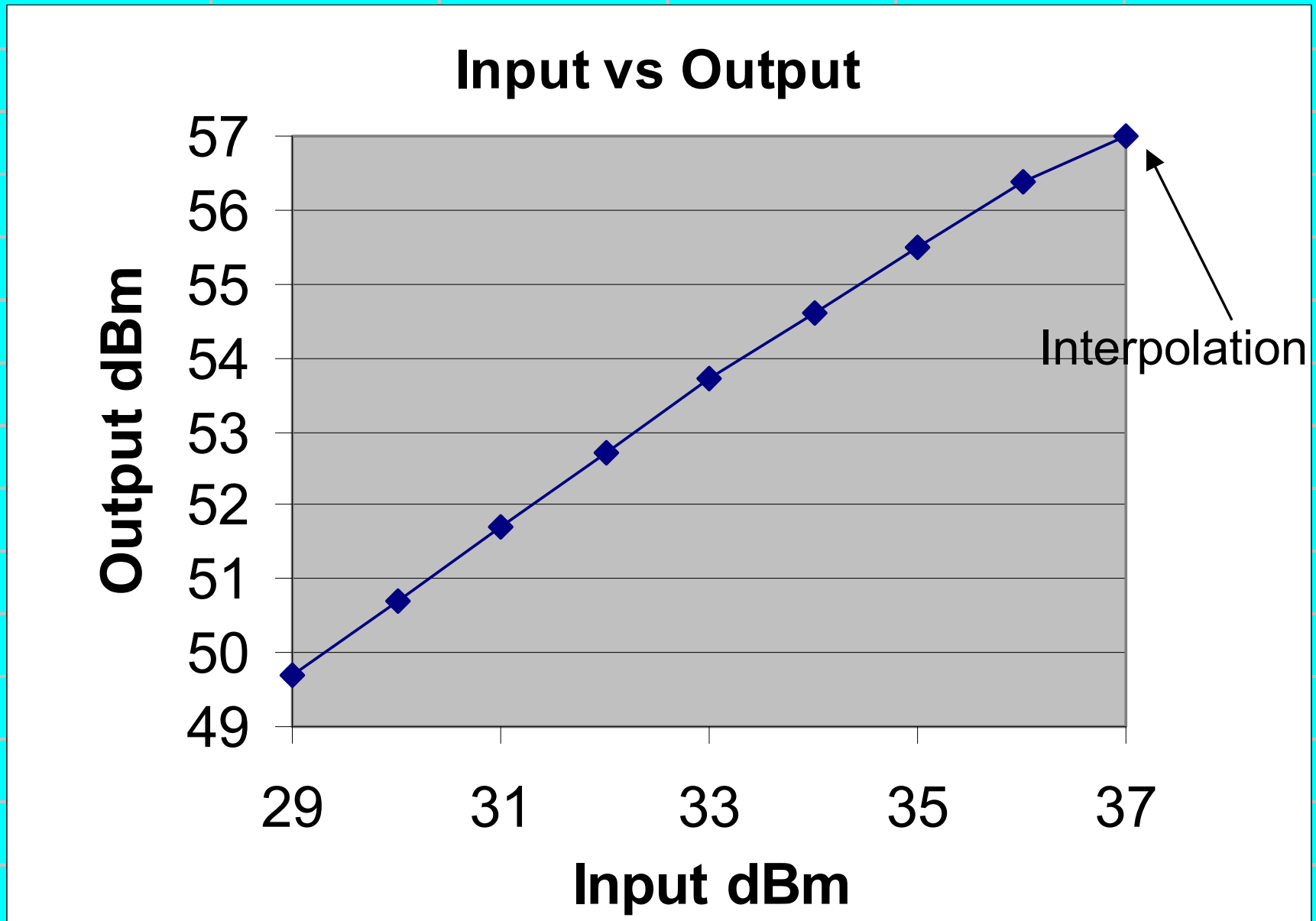

.4
.6
.2
.8
1
2
-5
-4
-3
-2
-1
3
-10
dBm


5 12
0
10
20
30
40
50
60
AMPERES


acdc electronics
EMERSON
MODEL
JF24N35F-104
SERIAL
AB1715
INPUT 115 VAC 50/60 HZ
INPUT 1650 VA
OUTPUT
COMPONENT
TYPE
CUSTOM
RECTIFIER




µW-mW
.4
.6
.2
.8
1
2
0
0
-5
-4
-3
-2
-1
-10
dBm
3
0
HEWLETT · PACKARD
435B POWER METER
ZERO
RANGE
LINE
OFF
ON
100
30
10
20
15
10


Input vs Output
Output dBm
57
56
55
54
53
52
51
50
49
29
31
33
35
37
Input dBm
Interpolation

Input dBm	Gain (dB)	RF Pout in		DC Power		Eff %
		dBm	Watts	Amps	Watts	
+31	20.7	51.7	147	35	840	17.5
+32	20.7	52.7	187	45	1080	17.3
+33	20.7	53.7	235	56	1344	17.4
+34	20.6	54.6	287	70	1680	17.1
+35	20.5	55.6	365	90	2160	16.8
+36	20.5	56.5	450	110	2640	17
*+37	~20.0	57.0	500	123	2941	17

All Data recorded at +24.0VDC

* +37dBm Input Data is a interpolation due to lack of power supply current capability!

Important Facts about this unit.

1. It weighs 95lbs. and measures 30” x 24” x 7”.
2. It has brackets for hanging on a wall.
3. It has a DIN output connector, N input.
4. A well regulated power supply with Voltage sensing should be utilized.
5. It should operate with less than 50 mW of RF drive if pre-driver is operating correctly.
6. This unit is specified to operate at 250 Watts output 24/7/365
7. Amplifier <u>will not</u> need to be optimized for 2304 MHz.

Methods to improve Performance

1. Increase wire size used on Drain supply for each amplifier.
2. Eliminate power supply board and develop a bias board with PTT circuit.
3. Utilize low level amplifier (repair if required).

Questions?


Down East Microwave
DEMI
EST. 1994

Thanks for listening!

Catch you on the air from

EM80KH real soon!

Well—maybe not!

